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ABSTRACT

This activities book for the junior high level is the fifth book of a series of six books designed to provide developmental K-12 experiences designed to support the basic environmental philosophy of spaceship earth presented in Book 1. The aims of the four activity sections of this book are to aid in developing students to make them more sensitive to their environment, able to recognize problems, reach a sophistication in using problem solving skills, and inclined to participate in action activities to deal with environmental problems. The Concept Development Activities Section was developed to assist teachers in assisting students to further their understanding of major concepts basic to the development of an environmentally literate citizenry. These concepts are: ecosystem, population, economics and technology, environmental decisions, and environmental ethics. The Skill Developing Activities Section identifies eight skills as being essential to the environmental problem solving process. For each of the eight skills, skill developing activities have been designed. The Values Clarification Activities Section contains sample strategies that teachers have found helpful in assisting students to clarify their values regarding environmental issues. The Environmental Encounters Activities Section contains a series of school-community environmental problem solving activities. (BT)

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ENVIRONMENTAL EDUCATION ACTIVITIES MANUAL

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William B. Stapp
Dorothy A. Cox

SE 019 507

JUNIOR HIGH ACTIVITIES

2

ENVIRONMENTAL EDUCATION ACTIVITIES MANUAL

Book 1: CONCERNING SPACESHIP EARTH

Book 2: LOWER ELEMENTARY ACTIVITIES

Book 3: MIDDLE ELEMENTARY ACTIVITIES

Book 4: UPPER ELEMENTARY ACTIVITIES

Book 5: JUNIOR HIGH ACTIVITIES

Book 6: SENIOR HIGH ACTIVITIES

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PREFACE

This grade level activities book is one in a series of six books which provide developmental K-12 experiences designed to support the basic environmental education philosophy of spaceship earth.

The educators who use this activities book are encouraged to thoroughly acquaint themselves with the philosophy, model description, implementing guidelines, and resource opportunities in Book 1.

The aim of the four activities sections of this book is to aid in developing students more sensitive to their environment, who are able to recognize problems, reach a sophistication in using problem solving skills, and are inclined to participate in action activities to deal with environmental problems.

The following pages include only a sample of activities meant to suggest a host of possible spin-offs. To be most effective they will most probably need to be altered to fit individual situations and students backgrounds.

William B. Stapp
Dorothy A. Cox

August, 1974

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Section I

Junior High School Concept Developing Activities

SECTION I

Concept Development Activities

The following Concept Development Activities were developed to assist teachers in assisting students to further their understanding of five major concepts basic to the development of an environmentally literate citizenry.

The five major environmental education concepts are: ecosystem, population, economics and technology, environmental decisions, and environmental ethics.

For each of the five concepts, specific understandings have been identified as appropriate for lower elementary, middle elementary, upper elementary, junior high, and senior high. Two activities have been developed for each understanding to assist students in furthering their understanding of each of the five concepts. The activities were also designed to enrich existing subject matter.

The concepts, understandings, and supportive activities that have been developed are listed on the following pages of this section.

Concept: Ecosystem

Understandings:

A. Lower Elementary (Kdg, 1st & 2nd)

1. The earth can be thought of as a "spaceship," containing all of the air, water, and land we will ever have.
2. The sun is the basic source of energy for all life in every ecosystem.
3. Plants capture sunlight and use it to help them make the food and oxygen that people and other animals need in order to live.
4. Some animals eat other animals which in turn eat plants; some animals (like people) eat both plants and animals.

B. Middle Elementary (3rd & 4th)

1. An ecosystem consists of all the plants and animals in a given area interacting with each other and their non-living environment.
2. The interaction of plants, animals and their non-living environment form many cycles in an ecosystem (carbon or food cycle, mineral cycles, water cycles, etc.).
3. Some of the sun's energy has been stored in coal peat, petroleum, natural gas, and other fossil fuels.

C. Upper Elementary (5th & 6th)

1. There are different forms of energy (i.e. light, heat, electricity, food, etc.).
2. Energy is neither created nor destroyed, but can be changed from one form into another.
3. With each transfer of energy (i.e., food chain) within an ecosystem, some energy is lost (mainly as heat energy).
4. Humans frequently, knowingly and unknowingly, waste energy.

D. Junior High (7th & 8th)

1. Anything added to the environment which accumulates in sufficient quantity to be unwanted by someone is pollution.
2. Too much pollution normally results in damaging the environment.

3. Natural cycles and systems have limited capacity to cycle or disperse pollutants.

4. Humans and natural resources are distributed unevenly around the earth.

E. Senior High (9th, 10th, 11th & 12th)

1. An ecosystem is complex and is vulnerable to sudden or long-term disturbances.

2. Human beings are capable of strongly altering the cycles and systems of the earth.

3. More diverse communities tend to be more stable.

4. Fission and fusion are two relatively new sources of energy.

Concept: Population

Understandings:

A. **Lower Elementary** (Kdg., 1st & 2nd)

1. A population is a group of plants and animals of the same kind living in the same area.
2. Populations interact with each other and their environment.
3. Populations are part of a given community.
4. The human community is closely interrelated with its environment.

B. **Middle Elementary** (3rd & 4th)

1. Populations increase, decrease, or stabilize depending on their interaction with each other and their environment.
2. The life style of a human population can affect the environment in significant ways.

C. **Upper Elementary** (5th & 6th)

1. Human beings both produce and consume materials.
2. Human populations have different standards of living which produce different environmental consequences.
3. As human populations grow, it becomes more difficult to attain and maintain environmental quality.

D. **Junior High** (7th & 8th)

1. Population changes like births, deaths, growth rates and migration patterns affect individuals, their surroundings and society.
2. The U.S. consumes a disproportionate amount of the earth's resources.
3. Populations have birth rates, death rates, growth rates, densities, immigration rates, emigration rates and age structures.

E. **Senior High**

1. As long as a few countries consume a disproportionate quantity of the earth's resources, while other countries need these resources, there will be political instability in the world.
2. Different sectors of populations have varying degrees of access to natural resources they need in order to survive.
3. Any position on human population policy has personal, social, ecological, political, and economic implications.

Concept: Economics and Technology

Understandings:

A. Lower Elementary (Kdg., 1st & 2nd)

1. In our country, people are generally trained to perform certain types of work. Teachers, farmers, factory workers, conservationists, as well as other workers, all have special jobs to perform.

2. The food most people eat, clothes they wear and the homes they live in are paid for by the money they earn from doing their jobs.

3. Industries and business sell some things that people want and need: and encourage people to buy some things that factories have made, but people don't really need.

4. Not all people have enough money to buy all the things they need, want, or are encouraged to buy.

B. Middle Elementary (3rd & 4th)

1. The way people live their lives has an effect on how the earth's resources are used.

2. The way people live their lives has a direct effect upon the amount and type of industrial growth that takes place.

3. Businesses can create a demand for a product through the use of advertising.

C. Upper Elementary (5th & 6th)

1. The cost of producing a particular product includes such things as the resources used, wages of workers, advertising, taxes and improving working and environmental standards.

2. There are two kinds of costs associated with pollution: the cost of preventing pollution, and the cost of (or damage from) pollution once it occurs.

3. Some pollution costs cannot be put into dollars and cents.

D. Junior High (7th & 8th)

1. Usually, the costs (economic, resource and technological) of goods and services vary proportionately to societal demands for those goods and services.

2. Patterns and practices of using the earth's resources are largely determined by people's life styles, and the level of industrialization necessary to meet the demands of such life styles.

3. As the production of goods increases with demand, consumption of resources also increases.

4. Both supply and demand of a product influence the cost of the product.

B. Senior High (9th, 10th, 11th & 12th)

1. Economic systems constitute the societal arrangements for producing and distributing the goods and services that individuals and societies desire.

2. Some businesses and industrial plants in the process of producing marketable products pass on social costs (i.e., air, water, and noise pollution) to society.

3. Satisfaction with the philosophy and functioning of the economic system is a major factor in the quality of life for individuals served by that economic system.

4. Each country has its own particular economic system, but all countries' economic systems are tied together through world markets of raw materials, food, and manufactured goods. Thus economic events that occur in one country affect other countries (i.e., crop failures).

5. Three major ecological trade-offs are (1) between population growth and environmental quality, (2) between levels of production and environmental quality, and (3) between the degree of urbanization and environmental quality.

Concept: Environmental Decisions

Understandings:

A. Lower Elementary (Kdg., 1st & 2nd)

1. To make a decision is to make a choice.
2. A decision can be made by one person or by a group of people such as a family or a class.

B. Middle Elementary (3^{rd} & 4th)

1. Environmental decisions should be made only after considering all alternatives and the consequences of each alternative.
2. Your personal feelings and the feelings of others should be considered before you decide to act.

C. Upper Elementary (5th & 6th)

1. Many environmental decisions are made by consumers, governments, businesses, industries, clubs, and various community groups.
2. People working together with similar interests can often be more effective in influencing environmental decisions than individuals working alone.

D. Junior High (7th & 8th)

1. Making effective environmental decisions requires consideration of ecological, economic, political and social and technological aspects of the problem.
2. Effective environmental decision-making includes considering carefully the pros and cons of all possible alternative solutions, policies and actions, and studying the trade-offs among them.
3. Individual or personal decision-making involves one's feelings, attitudes, and values.
4. In many cases it is necessary to change the law in order to prevent environmental abuses.

E. Senior High (9th, 10th, 11th & 12th)

1. Decisions not carefully thought through frequently have unwanted results.
2. People most often affected by environmental abuses may be the least able to bring about effective action to correct them.

3. Environmental decisions should seek to improve the lives of people from all socio-economic classes.

4. Some people and organizations have more power to influence decisions than others.

Concept: Environmental Ethics

Understandings:

A. Lower Elementary (Kdg. 1st & 2nd)

1. Children all over the world have similar basic needs.

2. Every individual has something which he gives and which he receives from society.

B. Middle Elementary (3rd & 4th)

1. If human beings protect the earth it will be able to continue to support a diversity of living things.

2. Humans can be "stewards" of the earth, rather than careless exploiters of it.

3. Humans can develop both a way of thinking and feeling about the earth if we are to live harmoniously with each other and our environment.

C. Upper Elementary (5th & 6th)

1. If humans develop an ecologically sound way of thinking, feeling, and acting toward the earth, then we will be able to live harmoniously with each other and our enviornment.

2. If we protect the earth it will continue to meet the needs of all living things, now and in the future.

D. Junior High (7th & 8th)

1. The earth's resources exist for all living things, not just man.

2. Certain life styles enable man to live as a complimentary part of the environment.

E. Senior High (9th, 19th, 11th & 12th)

1. Only when each of us lives a life guided by respect for the earth and all living things, now and in the future, will we be able to live in harmony with each other and our environment.

2. An essential part of an environmental ethic is a human ethic based on social justice for all individuals and groups.

Junior High

Ann P. Sibole

Is Your School a Closed System?

1. Concept to be developed: Ecosystem

2. Understandings to be developed: Anything added to the environment which accumulates in sufficient quantity to be unwanted by someone is pollution.

3. Time: 2 class periods

4. Materials: Question sheet containing the following questions:

   a. Does the school have pop machines? Are they returnable bottles?

   b. What happens to the garbage from the cafeteria after lunch?
   What could be done with the paper?
   What could be done with the wasted food?

   c. Does your school use washable plates, silverware and glasses?
   If not, what does it use?
   Do you see anything wrong with that?

   d. Is school trash burned on the site? If not what happens to it?

   e. How many teachers run dittos on both sides? Question 10 and figure the percentage.

   f. How many teachers use scrap paper for short quizzes or other activities in the classroom? If they do not, ask their reasons. Ask 10 and figure the percentage who do.

   g. Do any teachers have a box for scrap papers to be tossed and taken to a recycling center.

   h. Does the office use recycled paper? If not, ask them for their reasons.

   i. Some schools use scrap paper to make scratch pads. Does your school?

   j. The school furnace uses oxygen when it burns fuel to heat the school building. Plants tend to replace some oxygen that man's activities use up. Does your school have any trees on the site? How many of what kinds? Where would you like to see more trees planted? For what reasons?

   k. Grass and other green plants will do much the same thing that trees do with oxygen. Does the school site have lawns and shrubs?

   l. Is it realistic to try to make a school a closed system?
   Why or why not?

m. Name some things that schools use which are not kept on the school site and most likely could not be recycled.

n. Mention some things which have to be brought into the school which the school cannot provide for itself.

o. Is it possible for an entire nation to be a totally closed system? Name some things which it cannot keep within its boundaries - things which are shared by all nations whether man would like it that way or not.

p. Name some things which the United States must get from outside her borders.

q. What is the only physical unit (area) which can be called an actual closed system?

5. Procedure:

a. Introduce the idea of a closed system by discussing how a school could partially operate on a closed system approach.

b. Hand out question sheets and allow students to work outside the classroom in pairs, answering as many questions as they can in the time allowed (30-35 minutes). Encourage them to ask people lots of questions.

c. Report back on their findings the following day in a discussion session.

6. Discussion Questions:

a. Are there ways you see that the school operates as a closed system? Name these.

b. List ways it could operate more like a closed system.

c. Choose one of these and list the steps you or some one else might take to try to make the change occur.

d. What did you learn about the school or the people in the school that you did not know?

e. Did people cooperate? Did they refuse to give the information you were seeking?

Where Does It Go

1. Concept to be developed: Ecosystem.

2. Understanding to be developed: Anything added to the environment which accumulates in sufficient quantity to be unwanted by someone is pollution.

3. Time: 2-3 days -- day 1. Clean up.
   day 2. Compilation of data and preparation of bulletin board chart.
   day 3 Optional film: Clean Town U.S.A.

4. Materials: Litter collection bags, meat paper or poster board, paints, colored pens, pencils,
   Film: Clean Town U.S.A.

(Suggested Chart) POLLUTANTS

Type of Material	Quantity
1. Bottles	1. About 400
2. Cans	2. About 350
3. Smoke	3. Four sightings
4. Plastic	4. About 25#.

5. Procedure:

   a. Clean up around school in a given area.

   b. Bring refuse to a central area to be picked up by a sanitation crew.

   c. Dump trash and estimate amount of each type of waste.

   d. Observe on clean up other types of waste that cannot be picked up.

   e. Return to school with data.

   f. Make a chart of types and amounts of waste picked up and observed on clean up.

   g. View film about Franklin, Ohio: Clean Town U.S.A.

6. Discussion Questions:

   a. What do you think pollution means?

   b. When does a waste product become a pollutant?

   c. How many types of pollutants did we identify?

   d. What can our community do to help eliminate pollution?

e. What has Franklin, Ohio done about its waste problem?

f. How are the solid wastes of Franklin, Ohio recycled?

g. What uses are there for the recycled products?

h. What natural resources can be conserved by recycling waste products?

i. Why don't all communities have waste recycling plants like Franklin, Ohio?

7. References:

The Real World Books on Pollution:

The Waters of the Earth
The Air We Breathe
The Land We Live On
The Dangerous Atom
The Noise We Hear
The Food We Eat
The Balance of Nature
The Population Explosion

Jones, Claire: Gadler, Steve J.; Engstrom, Paul H.
Learner Publications Company, Minneapolis, Minnesota 1971.

Junior High B. Diane Boyd

How Pollution Harms Us

1. Concept to be developed: Ecosystem

2. Understanding to be developed: Too much pollution normally results in damaging the environment.

3. Time: 2 - 3 days (1 hour periods)

4. Materials:

    a. A recent map of your community.
    b. A map of your community that is approximately 25 years old.
    c. A map of your community that is approximately 50 years old.
    d. Cameras (approximately 1 per 5-6 students)
    e. Film

5. Procedure:

    a. Divide the class into 3 groups. The first group will study the recent map, the second the 25 year old map, etc.

    b. The groups will interview citizens after school. The first group will interview the community as it exists today. The second group will interview citizens who have lived in the community for 25 years, and the third group will interview the elderly who have lived there for 50 years.

    c. Make up a questionnaire with the students. The following is a sample of questions that might be used:

        (1). What changes have occured since you have lived here?

        (2). Are you aware of any kinds of pollution in your area or nearby?

        (3). Specify the kinds of pollution you have observed. (For example, noise, air, visual, water, etc.)

        (4). Have you tried to change any of the sources of pollution?

    d. Collect and summarize the collected data.

    e. With the students, take a walking tour near the school site and photograph evidence of pollution. (You may want to sign out cameras for students who know of areas they may wish to photograph after school.)

6. Discussion Questions:

   a. Have the changes that have occured been harmful or helpful?
   b. How do citizens feel about the changes?
   c. What could have been done to prevent some of the harmful changes?
   d. Looking ahead, what changes do you foresee?
   e. Will these be harmful or helpful? Why?
   f. What can we do to prevent the harmful ones?
   g. What can we do as a class to begin to effect change?
   h. Can our plan be modified to be employed on a national level?

7. References:

   a. Environmental Education Instructional Activities. The University of the State of New York. The State Education Department, Albany, New York 12224. 1970.

Junior High | Jim Colliton

Noise Pollution

1. Concept to be developed: Ecosystem

2. Understanding to be developed: Too much pollution normally results in damaging the environment.

3. Time: 3-5 days - day 1 - Introduction to equipment, noise pollution, areas of study
   day 2-5 - Collect data, draw graphs, charts

4. Materials:

   a. Pencil and paper
   b. Decibel meter
   c. Audiometer
   d. Stop watch

5. Procedure:

   a. Select 10 different areas in and around your environment and identify each.

   b. Observe and record volume and essential information regarding noise pollution.

   c. Each student should record two readings, at two different times, for each site.

   d. Students should record the different sources of each noise - man, plants, wind, cars, water, insects, echo, etc.

   e. In the classroom or comfortable site, students should compile information and compare data.

   f. Compile raw data so that the lowest to largest volume is shown. Compare to a decibel chart found in an encyclopedia.

6. Discussion Questions:

   a. In your opinion, which sounds are/are not pollution and how are/are not they damaging to the environment?

   b. What are the effects of noise pollution you've seen? Infer what has or is happening because of noise pollution.

   c. Are there any laws protecting the individual from noise pollution?

d. Is there anyway to buffer or lessen some of your sources of noise? Explain.

e. Can any of the sound(s) recorded be changed from endangering to not endangering or vice versa.

f. What are some of the long and short term effects on the environment and people.

g. Rank your group of noise pollution so that the most desirable is first and the least is last.

h. Compare the above (g) to #5(f).

7. References:

a. Environmental Education for the Seventies, Purdue University, 1973.

b. Pollution. Mine Publications, Inc., 1971.

Nature versus Pollutants

1. Concept to be developed: Ecosystem

2. Understanding to be developed: Natural cycles and systems have limited capacity to cycle or disperse pollutants.

3. Time: 5-6 days - day 1 - Overview of natural cycles and films
   Assign problem
   day 2 - Discussion of evidence of pollution & grouping
   day 3 - Group meetings & research
   day 4 - Research
   day 5, 6 - Panel presentations

4. Materials:

   Films: Cry of the Marsh
   Clean Town U.S.A.
   Film projector
   Pencils, pens, paper
   Access to library materials

5. Procedure:

   a. Discuss the meaning of pollution.

   b. Discuss ways man combats pollution.

   c. View the film Cry of the Marsh (12 min. color)

   d. Discuss man's destruction of nature's balance.

   e. View the film Clean Town U.S.A. (20 min. color)

   f. Discuss effort to recycle waste products

   g. Assign each student to find pollution problem

   h. Discuss problems

   i. Divide into groups of 5-6 with common pollution problems

   j. Research problem and prepare panel presentation

   k. Present panel discussions

6. Discussion Questions:

   a. What is meant by pollution?

   b. When does a waste become a pollutant?

   c. To what extent can nature eliminate the waste before it becomes a pollutant?

   d. What has man done to upset the balance of nature (1st film)?

   e. What steps are being taken to relieve our waste problems (2nd film)?

   f. What types of pollution do you find in your community?

   g. How are wastes gathered and disposed of in your community?

   h. How widespread is this pollution problem in your community? your country? your world?

   i. What can nature do to eliminate these pollutants?

   j. What has man done or can he do to help eliminate these pollutants?

   k. What do you see for the future of your compunity as far as the pollution problem is concerned?

7. References:

   a. Earth, the Great Recycler, Russell, Helen Ross. Thomas Nelson Inc. Nashville/New York. 1973.

   b. Pollution: The Real World Books

      The Waters of the Earth
      The Air We Breathe
      The Land We Live On
      The Dangerous Atom
      The Noise We Hear
      The Food We Eat
      The Balance of Nature
      The Population Explosion

      Jones, Claire; Gadler, Steve J.; Engstrom, Paul H.
      Lerner Publications Co. Minneapolis, Minnesota, 1971.

Junior High B. Diane Boyd

A Closer Look at Trash

1. Concept to be developed: Ecosystem

2. Understanding to be developed: Natural cycles and systems have limited capacity to cycle or disperse pollutants.

3. Time: 3 - 5 days (1 hour periods)

4. Materials: (Optional)

    a. Information on sanitary landfills

5. Procedure:

    a. When the wastebasket is full, place its contents on the floor or table.

        (1). Look at what has been thrown away.

        (2). Ask members of the class to suggest ways that the discarded items could be reused.

    b. Have each student look through a wastebasket at home and list several items with suggestions as to how each discarded item might be reused.

    c. Plan a trip to a nearby sanitary landfill so the students can look at where their discarded wastes go.

    d. Point out the environment surrounding the landfill:

        (1). Is the area attractive?

        (2). Is there water nearby?

        (3). What effect might the landfill have on its surroundings?

    e. Instruct the students to visit a nearby store or to look at home for products that are in disposable containers or ones that have excess packaging. Ask them to list or bring in some of these products, discussing them the following day.

6. Discussion Questions:

    a. What happens when we discard an item?

    b. What happens to an item after our trash is picked up?

c. What will happen if we have more trash than space available to bury it?

d. Why do manufacturers produce items with excess packaging?

e. Why do we buy items with excess packaging?

f. What can be done to discourage manufacturers from producing non-recyclable items?

g. Where are some places where you might see an empty pop can?

h. What can be done as an individual to help?

i. What can be done as a class or school to help?

Junior High Ann P. Sibole

Cookie Concerns

1. Concept to be developed: Ecosystem
2. Understanding to be developed: Humans and natural resources are distributed unevenly around the earth.
3. Time involved: 30 minutes.
4. Materials: Bag of cookies with enough for everyone in the classroom
   Tape recorder and tape
5. Procedure:
   a. Dump the cookies out into two equal piles on separate trays. Start the tape.
   b. Give one tray to two people in the class and tell them they may have all they want of the pile.
   c. Give the other tray to the rest of the class to share. There should not be enough to go around in this pile. Be sure to notice every detail of behavior that takes place here.
   d. Let things go for a while without comment or explanation. They are role playing without knowing it!
   e. Ask them to settle down and stop the recorder.
6. Discussion Questions:
   a. Do you know why this activity was done?
   b. If cookies represent all the natural resources and wealth in the world, who do you suppose the two people with half the cookies represent?
   c. How did the rest of you feel? Do you suppose the poor in India, Brazil or Mexico feel the same way?
   d. How did the two Americans feel about their position in the class activity? Do you think your feelings are similar to the way the American public seems to feel about the lack of food, medicine and conveniences in other parts of the world?
   e. Play back the tape and stop to discuss interesting comments, trying to equate them to current world crises.

Junior High   Marilyn Ryden

Natural Resources vs. World Power

1. Concept to be developed: Ecosystem

2. Understanding to be developed: Humans and natural resources are distributed unevenly around the world.

3. Time: 3 days - day 1 - Research, explanation of assignment
   day 2 - Finish research, compile data, complete chart
   day 3 - Discussion

4. Materials:

   a. Library
   b. Pencils and a felt pen (one color)
   c. Data tables for students
   d. Large data table for classroom use (poster board)

	Population	Water	Forests	Uranium or Plutonium	Petroleum	Agriculture (fertile soil)	Major Natural Resource
United States							
Soviet Union							
India							
The Netherlands							
China							
Chad							
Canada							
Kuwait							

5. Procedure:

   a. Prepare copies of the chart for each student.

   b. Prepare a large copy of chart for classroom use.

   c. Make sure students understand what a natural resource is.

d. Students (singularly or in groups) are to find out by library research if each of the countries listed have each of the natural resources listed.

e. Students should indicate on their chart if the country has the resource, and if it is considered a major resource in that country.

f. Students should also find the population of the country and list it on the chart.

g. Students should also find the major resource of each country and list it on the chart.

h. When all the information has been gathered it can be entered on the large chart by the following method: If a country has the resource listed as a major resource, color in the appropriate block. Fill in population number and the major natural resource.

i. The chart should be done in all one color felt pen to eliminate the confusion of a number of colors on the chart.

6. Discussion Questions:

a. What is world power? How is it determined?

b. What are the countries with the greatest and the least natural resources?

c. How do the countries with the greatest and the least natural resources rank in world power?

d. Can you see a relation between a country's natural resources and its position as a world power?

e. Are there any countries with a lot of natural resources but with very little world power?

f. If you were in a government with a lot of natural resources but with little world power, what could you do to obtain more world power? Can you give any examples of methods which some governments have actually used?

g. What is supply and demand?

h. Why do some countries with many natural resources have so little power? Are these countries using their natural resources wisely? Could there be other reasons for their lack of power?

i. Does the population of a country necessarily make it a world power or a strong country? Can a very large population in a country be more of a disadvantage than an advantage? Can you give examples?

j. What are some other important natural resources besides the ones listed on the chart?

7. References:

   a. Encyclodedia
   b. National Geographics
   c. World Geography texts

Junior High

Ann P. Sibole

Cemetery Population Study

1. Concept to be developed: Population

2. Understanding to be developed: Population changes like births, deaths, growth rates and migration patterns affect individuals, then surroundings and society.

3. Time: 3 days - day 1 - field trip
   day 2 - compile data, draw graphs
   day 3 - discussion

4. Materials: Cemetery and access to it, preferably with dates of death before 1900.

   Data tables for each student:

Death Rates Within Specified Age Categories

Age of Death

Time Periods		0-5	6-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Over 90
	1926-1974	no. %										
	1875-1925											
	1824-1874											

Chalk (for field trip)
Graph paper
Colored pencils or pens
Rulers

5. Procedure:

a. Choose a cemetery that has dates of death prior to 1900 and is fairly large.

b. Each student will make ten entries on his sheet (or that number which will give the class about 300 pieces of data).

c. Students should make note of any information concerning cause of death.

d. Students should not be biased in choosing or not choosing certain stones. Mark stones with a piece of chalk (small X) so other students know not to record the stone again.

e. Back in classroom, compile data sheet on one master sheet by having students add their totals. This will give totals for each time period for each age range. Figure percentages.

f. Ditto the master sheet so each student can have a copy, or every other student, at least.

g. Students will graph each time period, using the age at time of death as the horizontal axis (i.e. 0-5, 6-10, etc.) and percent of sample in each age category (i.e. 0, 2, 4, etc.) as the vertical axis.

h. Suggest using a different color for each time period (i.e. 1821-1870, etc.).

6. Discussion questions:

a. Why do we have to change totals to percents in our data? What would totals do in the graph?

b. Which age group experienced the largest decrease in deaths?

c. How could you explain this decrease in each of the time periods?

d. What factors may have influenced the reduction in the death rate of the 21-30 year old group in these time periods?

e. What has happened to life expectancy (the average number of years a person is expected to live)?

f. What two factors leading to greater population size are shown?

g. Why might these data differ from city to country records data for the same time period?

h. From information provided, can you detect any significant migration patterns?

i. From the information provided can you make any inferences concerning the effect of people on their surroundings and society in general?

7. References:

a. Pollution, N.A.B.T. 1973. Human Life Table and Survivorship Curves: A Laboratory Study, Ken R. Marion.

b. Equilibrium (magazine). January 1974.

Junior High

Carolyn Kelley
William L. McKeand

SCHOOL POPULATION STUDY

1. Concept to be developed: Population

2. Understanding to be developed: Population changes like births, deaths, growth rates, and migration patterns affect individuals and their surroundings and society.

3. Time: 2 days - day 1 - compile school population and graph
   day 2 - discussion

4. Materials: School population figures, graph paper, pencils, pens, rulers.

5. Procedure:

   a. Give students the following school enrollment figures:
      1. Enrollment, Fall
      2. New students enrolled
      3. Students who have left since fall
      4. Present school enrollment

   b. If the actual figures don't show a significant difference to work with, you may wish to use hypothetical values.

   c. Have students graph the population figures on bar graph for ease of comparison and calculation.

   d. Refer to the graph whenever possible to help in answering the discussion questions.

6. Discussion Questions:

   a. What is the population increase due to new individuals entering the school (imigration)?

   b. What is the population decrease due to individuals leaving (emigration)?

   c. What is the growth rate? (found by comparing the number of students at the start of the school year to those at the close) What is this growth rate expressed as a percentage? (found by dividing the original enrollment into the total increase).

   d. What will your school's population be for each of the next five years?

   e. At the present growth rate, how long will it take your school's population to double? To double again? How do the doubling times compare?

   f. Assuming no physical change in the size or number of rooms in your school, what affect is the population of the next five years going to have on your school?

   g. What affect will increased or decreased migration rates, birth rates, or death rates have on your school?

7. References: People, Cook and Lecht, Columbia Books, 1968.

U.S. Population & Resource Use

1. Concept to be developed: Population

2. Understanding to be developed: The U.S. consumes a disproportionate amount of the earth's resources.

3. Time: 5 days - day 1 - Explanation of unit
   Review the making of a graph
   Hold up some political cartoons and discuss
   Assign jobs and groups
   Answer questions
   day 2 - Compile data, make graphs, cartoons, slogans
   day 3 - Present projects to class--discuss
   day 4 - Finish presentations. Panel discussion
   day 5 - Discussion

4. Materials: almanacs, atlases, graph paper, drawing paper, rulers, pens, colored pencils.

5. Procedure:

   a. Each student or group of students will select (or be assigned) one of the following projects:

      1. Construct a vertical bar graph, 8 1/2 x 11 in size, of any of the following:

         a. U.S. percent of population and U.S. percent of world energy
         b. Oil consumption of U.S. vs. the world
         c. Iron ore usage of U.S. vs the world
         d. Other graphs on whatever information is available to class--copper, bauxite, T.V. sets, radios, autos, meat consumption, paper, uranium, etc.

      2. Conduct a survey of the neighborhood. Each student survey five homes, gathering the following information:
         a. How many have four cars, three, two, one?
            How many have 6 T.V.'s, 5, 4, 3, 2, 1?
            How many have 6 or more radios, 5, 4, 3, 2, 1
            3 or more phones, 2, 1
            4 or more magazines or newspapers coming into the home, 3, 2, 1, 0
            3 or more phonographs, 2, 1
            As many as you have students for washers, dryers, dishwashers, air conditioners, toasters, hair dryers, etc.

         b. Compile data back in classroom
         c. Each student should take one subject, figure the

percentage and construct graph, e.g. 8% had four T.V.'s 12% had three, 40% two, 40% one.

b. Present graphs to class with Discussion

c. Make a cartoon to illustrate disproportionate U.S. share of resources that might appear in the foreign press. Display and discuss.

d. Compose some slogans illustrating the same thing that might be scrawled on one of our embassy walls abroad--clever, appealing (Yankee Go Home[).

e. Simulation. Upper level students. Three to five will act as visiting American students before the class who will be acting as students in a selected underdeveloped nation school. Like "Meet the Press", the class is polite, but critical. How many autos does your family have? How many televisions? Dishwashers, etc.? Can the panel defend their right to have all this?

6. Discussion questions:

a. Do underdeveloped nations have a right to be outraged by our tremendous use of resources? Why?

b. Is the U.S. overpopulated? Explain.

c. Why has the U.S. been able to maintain its standard of living so high?

d. Do the underdeveloped nations have a right to expect that they can achieve the same heights? Explain the consequences of such a universal increase.

e. Is it likely that the rest of the world can ever match our present standard of living? Why or why not?

f. Should we slow down our rate of technological advance? Are you willing to forego that new wall-sized, 3-D T.V.? What would be the economic consequences if we agree to stop buying new products? If we considered all our purchases?

g. Based upon our high standard of living, how would you think our rate of pollution compares with other nations? Explain.

h. What do you predict will happen in the near and the distant future regarding the use and abuse of natural resources?

7. References:

a. The Complete Ecology Fact Book. Edited by Philip Nobile and John Deedy. Anchor Books, Doubleday & Company, Inc. Garden City, New York 1972.

b. Are We Running Out of Fuel. Irving Bengelsdorf.

Junior High Glen Erickson

Should the U. S. Always Get the Most?

1. Concept to be Developed: Population

2. Understanding to be Developed: The U. S. consumes a disproportionate amount of the earth's resources.

3. Time: 3-5 days

4. Materials: pencil, paper, poster board, library.

5. Procedure:

   a. Divide the class into groups of 2 or 3.

   b. Have each group decide on one country to research, making sure that the U. S. and other major developed countries along with developing countries are chosen.

   c. Have the class suggest sources of information on world resource consumption, such as:

      1. Library: encyclopedia, resource texts, etc.
      2. Magazines: National Wildlife, National Geographic, etc.
      3. Local environmental groups or Ecology Center.
      4. Newspaper.

   d. The groups, after selecting a country, should begin researching the resource consumption of their country, looking at:

      1. Types of resources consumed: major and minor ones.
      2. How the country obtains the resources they use.
      3. Amounts of resources used per year, and how this consumption relates to the total world consumption of these same resources.
      4. Types of resources that the country needs but has difficulty obtaining, and the reasons for this difficulty.

   e. Have the class include other items of information (other than the items above) they think of that relate to other countries; that are not specific to their selected country.

   f. After the groups have researched their countries, have the class compile their information in the form of a chart or model to illustrate the proportional consumption for each country of the total world resource consumption.

g. If possible, have the class determine how these proportions of resource consumption will change in the future. For example, developing nations will consume rapidly increasing amounts of certain resources (metals, minerals) as they become industrialized.

h. Play Baker's Dozen, found also in this booklet under Valuing.

6. Discussion Questions:

a. Are the countries which consume the majority of the earth's resources heavily industrialized, technological nations?

b. What proportion of the world's population is in the U. S., and what proportion of the resources consumed in the world are consumed by the U. S.? Why is there such a difference in these two proportions?

c. What percentage of certain items, like automobiles, televisions, radios, are used in the U. S. compared to the total world use of these items?

d. Suppose that only so many automobiles could be produced; and no more, should the U. S. get most of them because we already have the roads, expressways, and service stations that are necessary for cars, instead of developing countries which would have to build roads and stations for cars?

e. Is it right for the U. S. to consume such a disproportionate amount of the earth's resources? If not, what are some ways to change the situation?

f. What ways can you, as a member of the most affluent nation in the world, adjust your life style so that you consume less energy and less resources so that other people in the world might have higher standards of living?

Junior High

Pat Baron

Population of a Community

1. Concept to be developed: Population

2. Understanding to be developed: Populations have birth rates, death rates, growth rates, densities, immigation rates, emigration rates and age structures.

3. Time: 1 month - to collect data
   5 days - to compile and interpret data

4. Materials:

   a. Graph paper
   b. Blank map of the community
   c. Paper and pencil, colored pencils
   d. Ruler

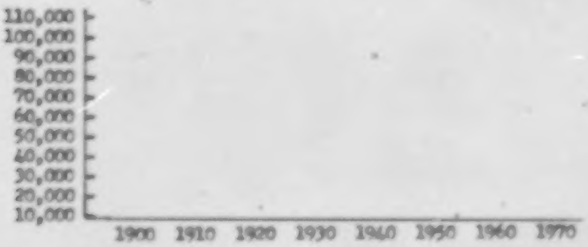
5. Procedure:

   a. One month before the actual compilation of data, have the students use the birth record and obituary sections of their local newspaper. For one month they should keep a record of births and deaths in the community.

   b. During this month also have the students contact real estate offices to determine how many people moved into and out of the community in the past year.

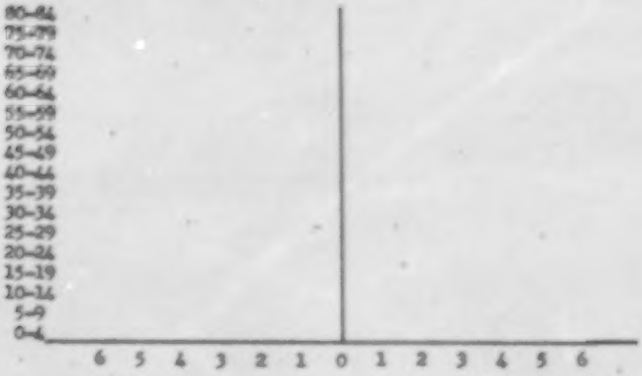
   c. Using the data on birth and death rates, graph the information on one sheet of graph paper using one color for births and another color for deaths.

   d. Using the census reports for your community, determine the population from 1900 to 1970 and graph the information using a bar graph.



   e. Using the latest census data determine the number of people per square mile in your community. On a blank map of the community and using a color code for varying population densities, fill in each square mile of the map.

f. Again using data from this latest census report, construct a population pyramid.



6. Discussion Questions:

   a. Why is one month too short a time to accurately measure birth and death rates?
   b. Why is one year an inaccurate time limit for measuring community immigration and emigration?
   c. At the present birth, death, immigration and emigration rates, will your community change much in the next ten years?
   d. Would you say that your community is a stable one? Explain.
   e. Are there specific times when more people enter and/or leave the community? Why?
   f. How has population density changed in your community?
   g. Why does your community have the density pattern that it does?
   h. How does the age structure of your community affect its economy, schools, recreational programs, police and fire departments, crime rate, stores, etc.?

7. References:

   a. United States Census Reports

   b. Ehrlich, Paul R. and Ehrlich, Anne H., Population Resources Environment, San Francisco, W.H. Freeman and Company, 1970.

Drosophila: Population Dynamics

1. Concept to be developed: Population

2. Understanding to be developed: Populations have birth rates, death rates, growth rates, densities, immigration rates, emigration rates and age structures.

3. Time: 2-3 weeks

4. Materials: 3 jars (gallon, quart, pint), wide-mouthed funnels or plastic tubes (optional), ripe fruit (bananas, peaches, pears), pencils, paper, fine screen, or cheesecloth.

5. Procedure:

   a. Divide the class into 3 groups.

   b. Have each group grow their own population of fruit flies (Drosophila) in different sized jars.

   c. Place the peeled fruit in each jar. Place the jars outside for 2 days, with no covers. This will give adult fruit flies a chance to lay their eggs and establish a population in each jar.

   d. Bring the jars back into the classroom and cover the jars with cheesecloth (optional: immigration and emigration can be observed using the funnels or tubing and will be described later).

   e. Have each group design a chart to record their observations on each day, including the following items:

      (1) Number of adult males (smaller than females, with solid dark tip on abdomen).

      (2) Number of adult females (larger than males, with stripes all along abdomen).

      (3) Number of larvae.

      (4) Number of young, winged flies (not yet adults).

      (5) Number of dead flies.

   f. If immigration and emigration rates are to be studied, then place plastic tubing through the cheesecloth of the original population to antoher jar, which is just like the original jar, but with no population. Funnels could be used by placing the funnel in place of the cheesecloth, leaving jar outside and observing the incoming and departing flies from the jar.

(1) Immigration rates can be found by calculation. Immigration = (Total adult population on day 2) - (Adults from day 1 - deaths + estimated adults maturing from young, winged flies). For use with funnel apparatus.

(2) Emigration rates can be easily calculated using the two jar set-up by observing simply the number of adults populating the second jar.

g. After recording data for 2-3 weeks, have the students compile and analyze their data.

(1) Compile a graph showing birth rates per day, death rates per day, population size (total) per day, population size of adult females, and adult males per day.

(2) Compile another graph showing age structures by calculating the percent of the population that are adult males, adult females, young winged-immature flies, larvae, and eggs.

(3) Calculate population densities by dividing the total population figures (adults, immature flies, larvae, etc.) by the volume of the container.

(4) Growth rates can be found by calculating the percentage of the population added each day compared to the previous days totals minus any deaths.

h. Have the 3 groups compare their findings.

6. Discussion Questions:

a. Were growth rates the same for all 3 groups? If not, why?

b. What effect does the size of the container have on population growth and death rates?

c. Were the population densities different for each container?

d. Given enough time would all 3 populations reach approximately the same density? What factors determine the size of the population?

e. Were birth rates the same or different as the populations increased? Does available food and living space affect reproduction rates?

f. Do human populations increase in the same ways that Drosophila populations increase?

g. What factors control human population size?

h. What does "Malthusian population dynamics" mean (any biology text should explain Malthus' theories)? Does it apply to your experiment?

i. What happens to a population that is rapidly increasing and is confined to a limited space? In human populations, can you think of ways a population changes because it is becoming overcrowded?

Junior High | Cynthia Addison

Bike Study

1. Concept to be developed: Economics and Technology

2. Understanding to be developed: Usually, the costs (economic, resource and technological) of goods and services vary proportionately to societal demands for those goods and services.

3. Time: 4 days - day 1 - explanation of study
   day 2 - research
   day 3 - making of video material
   day 4 - report day

4. Materials: supplies for making charts, bulletin boards, graphs, etc.

5. Procedure:

   a. The class will make an in depth study of something that has made a recent impact on society AND of particular interest to the 7th grade student. This example will be based on the bicycle explosion.

      1) Requirements for the study

         a) Students work in pairs on an area interesting to them.

         b) Students will make a visual display to support their findings. (Some students may wish to make a set of slides, movie or filmstrip instead of a chart, graph, bulletin board, collage, etc.)

         c) Students will make a brief oral report of findings and explain visual display.

      2) Suggested areas of study

         a) How has the recent demand for bicycles affected the price of bicycles over the last 5 years?

         b) How does the price of bicycles vary throughout the city?

         c) What materials are used in the construction of the bicycles? What are the major competitors for these materials?

         d) How has the bicycle affected the laws, interests, and expenditures of the city?

         e) What social groups have developed from bicycle popularity? What activities do these groups take part in? How does the group support itself?

         f) How has the increased use of bikes affected the jobs in your city?

         g) Public Interview - two or more groups may wish to work together on a joint questionnaire and then make separate reports.

            (1) Investigate public opinion of bike paths.
            (2) Investigate public opinion of laws concerning bicycles.

h) What expenses are involved with the use of the bicycle that are not included in the price of the bicycle? Include such things as equipment and upkeep.

i) What problems has the biking sport caused the police department? Vandalism? Accidents?

j) How has man's concern for the environment added to the biking boom?

k) Make a survey of the use of bikes in the city. Where are they used and for what reason?

l) What are the laws in your city concerning bicycle use?

m) What are the strengths and weaknesses of the different types of bicycles?

n) Mathematically prove why a 10-speed is faster. Investigate the wheel and axle first.

b. On the 4th (or 5th) day students report their findings to the rest of the class. Perhaps, the visuals can then be used for a display in the room or another part of the school.

6. Discussion Questions:

a. What is the most important reason(s) for the bike "boom"?

b. If there were a network of bike paths in your town, what do you think would happen to the price of bikes?

c. How many class members have bikes?

d. Do you use your bike only for recreation? What other uses? School? Errands?

e. Can you think of any reason why the cost of bikes would go down?

Product Demand and Cost Impacts

1. Concept to be developed: Economics and Technology

2. Understanding to be developed: Usually, the costs (economic, resource and technological) of goods and services vary proportionately to societal demands for those goods and services.

3. Time: Two hours - hour 1 - gaming simulation.
   hour 2 - discussion.

4. Materials:

   a. Clock or watch.

   b. Shoebox or similar-sized container.

   c. Scissors.

   d. Paper and pencil for each student.

   e. Ditto masters and access to a ditto copier.

   f. "Game overview" card for each group of five students in the class:

   "Consumer demand for a product determines, to a large degree, the price of that product. Many factors influence the level of consumer demand, which in turn influence product price. The purpose of this exercise is to examine how some of these factors operate to help influence demand for and price of a product."
   "Imagine that you are a member of the Presidential Economic Advisory Board. Your task is to predict how the price and consumer demand for oranges will change in a variety of different situations."

   g. "Specific situation" cards for each group of five students in the class:

      (1) Situation 1: "A crop failure strikes two-thirds of the country's orange groves."

      (2) Situation 2: "A team of medical researchers finds that oranges contain a unique vitamin which tends to prevent heart attack for people who eat more than two oranges per day."

      (3) Situation 3: "Orange grove workers form a labor union and go on strike to protest poor wages and working conditions."

      (4) Situation 4: "Someone invents an orange-flavored drink which contains an amount of the heart-attack preventing vitamin equal to that contained in oranges, but the new drink is only half as expensive to produce as natural orange juice and many people think it tastes better."

(5) Situation 5: "A Florida orange grower discovers that crop yield can be quadrupled by adding a newly discovered fertilizer to the orchard soil."

(6) Situation 6: "The federal government signs a trade agreement with the Soviet Union whereby three-forths of all oranges grown in the U.S. over the next five years will be traded to Russia in exchange for vodka and Siberian ice cubes."

5. Procedure:

a. Have the students write their names on equal-sized slips of paper suitable for a name drawing.

b. Place these name slips into the shoebox and draw names from the box so as to randomly divide the class into groups of five.

c. Previous to the exercise, have the "situation" cards typed and dittoed, so that each of the six cards can be distributed to each group if the class were to be divided into groups of five members.

d. Also previous to the exercise, have a set of "game overview" cards typed and dittoed so that one card can be distributed to each group if the class is divided into groups of five.

e. Distribute one "game overview" card to each group.

f. At every ten-minute interval over the next hour, distribute one "situation" card to each group, so that by the end of the hour, all groups have discussed each situation, as described on the cards.

g. As the groups receive each "situation" card, have them predict how and why the demand for and price of oranges would be affected. These predictions should be recorded for each situation.

6. Discussion Questions:

a. In a free-market economy, such as operates in the U.S.A., is the price of oranges flexible or inflexible as different situations arise?

b. Do the groups' predictions differ from one another as about the same situations?

c. Over all the situations, how does consumer demand for oranges affect their price?

d. What are some of the factors which influenced consumer demand for oranges?

e. Does this exercise reflect real-world product price fluctuations?

f. In the "real world", what factors have historically contributed to consumer demand for petroleum products and their prices?

g. In the case of oranges, would consumer demand have any affect upon the wages and working conditions of orange-grove laborers? Why or why not?

h. How does the price of oranges really change over a period of one year?

i. How can you account for these fluctuations?

j. How have changes in consumer demand for automobiles altered raw material usage over the past fifty years?

k. Besides oranges, what other product prices fluctuate yearly? How can you account for these fluctuations?

Junior High

Ann P. Sibole

Swinus Americanus!

1. Concept to be developed: Economics and Technology

2. Understanding to be developed: Patterns and practices of using the earth's resources are largely determined by people's life style, and the level of industrialization necessary to meet the demands of such life styles.

3. Time: 1 period - 90 minutes.

4. Materials: blackboard or overhead projector
   Question sheet (see #5. Discussion Questions.)

5. Procedure:

   a. Students form triads. Develop a list of the ways animals change their habitat. (example - beaver dams up streams) Opposite each, list the reason or reasons the animal makes the change. (Most of them will be for food or shelter or protection.)

   b. Then have them list ways man changes his environment. (Most of them will be economic - Xmas tree plantations, farming, lake shore recreation, etc.) You may prefer to do this either initially, or in summing up, on the board or overhead.

   c. Have students work individually now:

      Make a list of 13 appliances or uses for electricity in their home. When the lists are complete, have them do the following:

      1) Put a line under 3 which you could absolutely not live without.

      2) Put an X in front of 3 you could most easily live without.

      3) Put a 5 in front of those which you or your family did not have five years ago.

6. Discussion Questions:

   a. How do animals' reasons for changing the environment differ from man's reasons?

   b. Does man have some of, the same reasons as animals? Give examples.

   c. From what you may know about the American Indian's life style, did he change his environment?
      Does his impact seem as great as the impact each of us has on our environment? Explain and support your answer.

d. Did your family have fewer electrical appliances five years ago? How many less? How have the recent additions drastically improved your home life?

e. Find out what your monthly electric bill was for the last 2 months. Add them, divide by 2, then divide that by the number of people who live in your home. What is the average cost of electricity per person in your home?

f. How does it compare to other people in your class? Higher or lower? What might account for some rather big differences among families?

g. Write a short paragraph describing the changes that would occur if the 3 Xed electrical uses were eliminated. How would it alter your daily routine or that of another member of your family? Could it improve it in any way?

h. Do you have any ideas why we think we need these new convenience appliances and other items being developed each day, thanks to modern technology and mass production?

Junior High

Judith DeWitt
M.D. O'Farrell

Life Styles and their Influences on Natural Resources

1. Concept to be developed: Economics and Technology

2. Understanding to be developed: Patterns and practices of using the earth's resources are largely determined be people's life styles, and the level of industrialization necessary to meet the demands of such life styles.

3. Time: 5 days - day 1 - Introduction of concept
   day 2 - Film and discussion
   day 3 - Student and parent survey and Newsreel handout to be read
   day 4 - Film and handout discussion
   day 5 - Discussion on comparison of student and parent survey

4. Materials:

   a. Student wall chart
   b. Parent survey
   c. Ditto of handout

5. Procedure:

   a. Introduce the understanding using as a background the following: Energy and natural resource consumption in the U.S. is at an all-time high and predictions for the future indicate that it will increase sharply. Many of these natural resources are non-renewable. That is, when we use them they cannot be reused or recycled. Today energy use is an important part of our life style. Ironically the solution to many of our environmental problems (land, water, air) requires additional uses of energy and natural resources. Thus we seem to be confronted with somewhat of a dilemma.

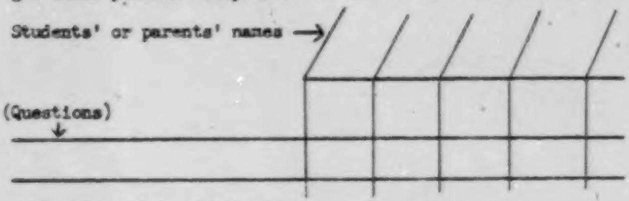
   b. Have students fill out Student Questionnaire (written on board or handout):

      (1). How many cars are in use in the U.S. today?
      (a) 40 million (b) 75 million (c) 112 million
      (2). How many cars are manufactured yearly?
      (a) 6 million (b) 13 million (c) 18 million
      (3). How efficient is the auto in terms of energy consumption?
      (a) 15% (b) 45% (c) 80%
      (4). How much land in your city is devoted to the use of the automobile? (a) 10% (b) 40% (c) 60%
      (5). How much air pollution today is attributable to the automobile? (a) 10% (b) 40% (c) 60%
      (6). Iron, as the basic raw material in the production of the auto, is a (a) renewable resource
      (b) non-renewable resource (c) recyclable resource

c. Show film: "Automobile: The Great Love Affair", color, 56 min. (CBS; McGH, 1966) This film is about the automobile as part of the American mystique and its impact on the economy and living patterns of Americans. Automobiles are symbols of status and conformity. Class discussion following the film.

d. Assign for reading the handouts on the energy crisis: "The Energy Crisis", Newsweek, January 1, 1973.

e. Post the student wall chart. Students will fill out their section by the next day. Have students take questions home to get their parents' responses and fill in that section also.



Questions for wall chart:
1. How do you usually get to school?
2. If you have to go a distance of less than two miles, what form of transportation would you use?
3. If you have to go a distance of more than two miles, what form of transportation would you use?
4. How many cars does your family have?
5. Would you use mass transit (bus, train) if available?
6. Which would you prefer to take: a train or a plane?
7. Do you think the air pollution control devices on autos are necessary?
8. If you had a 1975 model car, would you use no-lead, low-lead or regular gasoline?

(For parents, modify #1-5 to apply to when they were the same age as their children now.)

6. Discussion Questions:

a. How did your answers on the survey compare with your classmates? With your parents?

b. Does your life style demand products from industry?

c. Could you change your life style so that you will not need industry's products?

d. Would you be willing to change your life style? Are you satisfied with the demands you are making now?

Resource Consumption, Past, Present and Future

1. Concept to be developed: Economics and Technology.

2. Understanding to be developed: As the production of goods increases with demand, consumption of resources also increases.

3. Time: Two hours - hour 1 - gaming simulation & role comparison.
   hour 2 - discussion.

4. Materials:

   a. Paper and pencil for each student.

   b. Clock or watch.

   c. Shoebox or similar-sized container.

   d. Scissors.

   e. One "situation card" for each of one-half the class members: "Looking ahead into the future, what kind of place would you like to live in as an adult? List those things you would like to have as an adult."

   f. Another "situation card" for each student in the other half of the class: "You are the same age you are now, but you were born in 1866. The Civil War has just ended. Main means of transportation are by foot, by rail, and by horse. Most people are engaged in farming, and most people live in the country rather than in the city. Only a very few young people go to college; most make a living by farming or entering one of the trades (plumbing, construction, blacksmithing, etc.). Electricity has only been recently "discovered", and most homes have Kerosene lamps, a hand pump for water, and an outhouse. Vegetable gardens are common. You have no indication that cars or electricity will ever be available or useful in the home or for work. On this basis, list the things you would like to have as an adult in your home of the 1880's or '90's."

   g. Blackboard and chalk.

   h. Ditto masters and access to a ditto copier.

5. Procedure:

   a. Previous to the exercise, have each "situation" card typed and dittoed so that one situation card can be distributed to one-half of the class, and one of the other situation cards can be distributed to the other half of the class.

   b. Have the students write their names on equal-sized slips of paper suitable for a name drawing.

c. Place these in the shoebox.

d. Draw names from the shoebox so that the class is divided randomly into two groups.

e. To the members of one group, distribute the first set of "situation cards".

f. To the members of the other group, distribute the second set of "situation cards".

g. Ask all class members to write a paragraph or two about their adult lives, on the basis of information provided on the cards, and to list those things they would like to have as adults in their situations (a carriage, a car, a farm, a professional business, etc.).

h. Have the students describe the lifestyles they would lead in their situation, and to name the things they might own.

i. List these possessions on the blackboard, making one list for the "modern-day" students and another list for the 19th century students.

6. Discussion Questions:

a. Comparing items from the two lists, which set of possessions requires more resources to manufacture them?

b. Why do the modern possessions require more resources than those manufactured in the 1800's?

c. Judging from the items on the two lists, how has resource consumption changed over the last 100 years?

d. What factors have brought this change about?

e. How have prices changed for resources used now and for the same resources used 100 years ago?

f. What factors have brought this change about?

g. Judging from these patterns of change, what can you predict about resource use and resource prices in the next 100 years?

h. What can be done to alter this?

i. How many children would you like to have? (Total these for the entire class.)

j. How will all these new people affect the future pattern of resource use and price?

k. How does advertising affect consumer demand for products and resource usage?

l. Do advertisers show a concern for resource usage? How? Why or why not?

m. Would it be possible for everyone in the U.S.A. to grow his own food and make his own clothes? Why or why not?

n. What are some activities you do which require no resources at all?

o. Are there any human activities which require no resources at all?

Junior High

Michael D. O'Farrell

Study in Demand and Consumption of Natural Resources

1. Concept to be developed: Economics and Technology

2. Understanding to be developed; As the production of goods increases with demand, consumption of resources also increases

3. Time: 4 days - day 1 - introduction to concept and class survey, to be retained by students
   day 2 - film
   day 3 - discussion questions
   day 4 - give questionnaire again with discussion following

4. Materials: Class survey

5. Procedure:

   a. From the following list of items indicate your personal preference by circling the letter of your selection.

1. regular toothbrush	or	1. electrical toothbrush
2. regular comb		2. electric comb
3. towel dried hair		3. electric hair-dryer
4. safety razor		4. electric razor
5. regular shaving cream		5. heated shaving cream dispenser
6. regular electric fan		6. air conditioner
7. hand washed dishes		7. electric dishwasher
8. hand operated can opener		8. electric can opener
9. self-defrost refrigerator		9. frost free refrigerator
10. black and white TV		10. color TV
11. regular record player		11. deluxe stereo unit
12. fuel oil heat		12. electric heat
13. use alternative sources of energy (sun, wind, water)		13. nuclear energy
14. ride a bicycle		14. drive a car
15. Volkswagon		15. Ford LTD
16. drive a car		16. ride a bus or mass transit
17. take a train		17. fly in a jet
18. returnable containers		18. non-returnable containers

   b. Film "Ravaged Earth" - 27 min, color, very dramatic exploration of the demand for natural resources and the resulting environment impact and cost - followed by class discussion.

6. Discussion questions

   a. How do your choices reflect the typical American life style?

   b. Should we limit people's rights to own energy and natural resources using devices like air conditioners, electric heat, electric toothbrushes? Why or why not?

c. There will always be a little pollution in order to be prosperous, so why should we concern ourselves about it? Do you agree or disagree with this statement and why.

d. The standard of living in the U.S. is the highest in the world. Should we maintain it as such? Why or why not?

e. If you were to be taxed each time you used your electric toothbrush would you pay or protest? Why?

f. Some people argue that we ought to live without all the comforts of life. Do you agree, disagree and why?

g. Should we raise the cost of natural resources and energy so that people will regulate their use?

h. If man continues his present patterns in growth and use of goods, what dangers do you see in the future?

i. Give students the same survey again and have them compare their first selections with their test.

7. Give students questionnaire again and compare first and second responses.

8. References: Deciding How to Live On Spaceship Earth, 1973, R. Allen, C. Foti, D. Ulrich, S. Wooland. Plover Books, Winona, Minnesota, 55987.

Film: Ravaged Earth - color, 27 min. NBC (1969)

Yearling Sows Up a Quarter

1. Concept to be developed: Economics and Technology.

2. Understanding to be developed: Both supply and demand of a product influence the cost of the product.

3. Time: One week - First day - Lecture by Livestock Exchange or Extension Service official. Next four days - Newspaper monitoring.

4. Materials:

   a. Telephone book and access to a telephone.

   b. Your daily newspaper editions for the current week.

   c. Paper and pencil for each student.

   d. Large sheet of poster paper.

   e. Blackboard and chalk.

5. Procedure:

   a. By telephone, contact your nearest Livestock Exchange or county Agricultural Extension Service office.

   b. Ask whether or not it would be possible for an official of the agency to visit your class to explain how grower-supply and buyer-demand affect livestock prices.

   c. Ask the official to tell your students how to read the daily livestock market prices in the daily newspaper.

   d. Tell him that after his visit, you would like your students to be able to interpret these livestock market reports and the daily "farm market" reports broadcast by most television and radio stations.

   e. Just prior to the arrival of the agency official, post the most recent livestock market prices on the blackboard. The official can then use these to help students interpret market prices in the newspaper.

   f. After the agency official has left, have students post daily livestock market prices on the sheet of poster paper every day for the next week.

6. Discussion Questions:

   a. Have the market prices for different farm products gone up or down during the week? .

b. How do you account for differences in the ways different product prices fluctuated over the five day period?

c. What are the factors which determine whether the price of a farm product goes up or down over a given period of time?

d. How would the price of cattle be affected if the price of corn were to go down and stay at a low level for a long period?

e. What are "future market prices"?

f. How are these determined?

g. What is the role of the consumer in setting livestock market prices?

h. If the consumer population were to double, and the livestock grower population stayed at its present level, how would livestock prices be affected?

Junior High Pat Baron

Purchasing a Lunch

1. Concept to be developed: Economics and Technology.

2. Understanding to be developed: Both supply and demand of a product influence the cost of the product.

3. Time: 2 days - day 1 - planning and purchasing
   day 2 - lunch

4. Materials: (Based on a class size of 30)
   Play money - $10 per student
   10 bags of potato chips
   40 chocolate chip cookies
   3 pizzas
   20 white milk
   10 chocolate milk
   10 soda pop
   20 sticks of gum

5. Procedure:

   a. Arrange for the class to have lunch together in the classroom. All students would be required to attend on this day unless there would be a dietary problem.

   b. To offset food costs, let students share costs since they will not be buying a school lunch.

   c. The day before the lunch, set up two competing stores with two students running each store.

      Store #1 will be selling:
      1. 5 bags of potato chips
      2. 20 chocolate chip cookies
      3. 1 pizza
      4. 10 white milk
      5. 10 soda pop
      6. 10 sticks of gum

      Store #2 will be selling:
      1. 5 bags of potato chips
      2. 20 chocolate chip cookies
      3. 2 pizzas
      4. 10 white milk
      5. 10 chocolate milk
      6. 10 sticks of gum

d. Students will order and purchase food items a day ahead of time to limit food spoilage.

e. Give each class member $10 in play money. Let them buy whatever they want for lunch with it.

f. Store owners may set whatever prices they want for various food items. They should be encouraged to get what the market will bear. Perhaps the store with the most profit at the end of the day would give a prize such as a free dessert, etc.

g. The second day pass out the food as previously paid for by the students.

6. Discussion Questions:

a. What happened when some items were in great demand?

b. What happened to those food items few people wanted?

c. How do actual store owners get their food and goods that they sell?

d. What influences the supply of goods available to a store?

e. What factors besides price and taste would determine public demand for various goods?

Expressway Construction-Paving the Wave for Progess?

1. Concept to be developed: Environmental Decisions.

2. Understanding to be developed: Making effective environmental decisions requires consideration of ecological, economic, political and social and technological aspects of the problem.

3. Time: Two class periods.

4. Materials: Introductory remarks: The City Planning Commission has joined forces with the Federal Government to construct an expressway through the middle of the community. This community lies almost directly between a nearby metropolis and several large State owned recreational areas. The community has a population of 100,000, with the metropolis having 2 million people. The community has a central, urban core, along with a growing suburban district, surrounded by fertile farmlands. In class, we will simulate a planning session, in which, various interest groups will represent their positions in an attempt to:

   a. Approve the proposed plan.
   b. Recommend an alternative plan or route.
   c. Decide against any expressway construction.

   Position statements: These should be on large index cards.

   a. Displaced resident - The proposed plan places the expressway directly through my neighborhood forcing me to leave my home and move somewhere else. Wherever I move will be much farther from my job. My children will have to leave their school and friends. I won't be able to find another house to buy, with my present income, and will have to move into Public Housing, or rent an apartment.

   b. Dairy Farmer - The proposed plan for the expressway will go through one-half of my farm. My dairy herd will have to be reduced in half because of the loss of pastureland. I am told by other dairy farmers that my remaining cows will produce less milk because of the constant noise from the neighboring expressway. I don't think I can make it anymore as a farmer, with only one-half of my herd remaining. I feel all I can do is to sell my land to developers for a new shopping center. I enjoy being a farmer, and now, although I will receive a good price for my land from the developers, I can no longer farm and must look for another kind of job. I used to enjoy relaxing on my front porch under the large oak tree in my yard. The power company has informed me they must cut my tree down to put their power lines through to the proposed apartment complex that will be built alongside the new expressway. My oldest son will soon be graduating from the University's Agricultural School, and was planning to take over the farm in a few years, to keep the farm going like it has now for 100 years. I used to like the quiet, easy-going life on my farm, but I guess that is all in the past.

c. City Businessman - This new expressway is just what I've been waiting for. My downtown business will surely increase with more people coming downtown on the new expressway. I should also get more business from metropolitan people coming through on weekends, as they head for the State recreational areas beyond our city. I can now think of expanding my business, and placing another outlet on one of the new proposed shopping centers that will be serviced by the expressway.

d. City Council - We feel that the new expressway will be a huge economic boom to our community. People will be able to move much easier through the city, allowing people in suburban areas a quicker way to get to the downtown business district. The construction will provide many more jobs for the people in our community and will pave the way to more progress, more industrial growth, and more business from the neighboring metropolis. Our community needs this link to other communities to keep it alive and growing. Without it we will continue to remain isolated from the mainstream of our progressing society.

e. Resident Living Alongside Expressway - The new expressway will be placed directly alongside my home. I have heard that the noise from the constant traffic might keep my family awake at night. My job is only a short, five minute drive from my home now, because I can travel on little-trafficked residential streets. I understand that with the proposed expressway my normal route will be blocked off, forcing me to use the expressway to get to work. I imagine during rush hours it might take me 20-30 minutes to t travel to work. My children would have to cross over the expressway to get to school and I am worried about their safety. The street in front of my house is planned to be widened to four lanes to link up with the expressway. I think many of my neighbors will be moving away, as I see many FOR SALE signs in the neighborhood already. I like my home and do not want to move, but I am concerned about living so close to an expressway.

f. Construction Worker - Working on the expressway construction will mean a steady, high-paying job for me for several years. Maybe now I can start thinking about buying my own home. The expressway should lead to more construction in our community, which would allow me to maybe start a small construction firm of my own in the near future. I don't care where the expressway will be built, as long as it is built.

g. School Child - My parents tell me that the new expressway is planned to go right through the big woods and pond next to the school. I go there often for school field trips and also alone, or with my friends to walk in the woods, look at animals, go fishing, and to just sit in a nice quiet place. I even have a special place of my own where I go when I want to be alone. I don't understand why they have to build a road through my woods. No one ever asked me if I wanted it; and I don't.

h. Corner Grocery Store Owner - I am going to have to sell my business if the expressway comes through because many of my customers will be shopping at the large chain-grocery store that they can get to quickly by the expressway. I've run this store for 25 years and I have many regular customers who depend on my store to buy their food. Many of the older folks in this neighborhood can't afford to drive to the shopping centers, but I know I can't stay in busines with only my regular customers. I need the customers that will be going to the larger stores that they can reach more easily by the expressway, then they could before. I won't be able to compete. Maybe I can get a job in one of those chain-stores on the shopping centers, but I'm 55 years old and they might not want to hire me.

i. Environmental Citizen Group - We feel that the proposed plan of building the expressway through our city will cause many serious problems. Just look at other cities that have done the same. Their housing situation became critical, with the expressway going through the heart of the low-income housing. These people then can't find another home they can afford, and must rent or receive assistance from the local or Federal government for housing. The plan for the new expressway in our community will also destroy several city parks and many wood lots and fields that add so much to our city's environment. We are very concerned about the pressure to induce more growth in orr community, to keep pace with other cities. Our city has a unique character of its own and we are afraid of losing that by placing an expressway through the middle of our city. We propose another plan for re-routing the expressway around the immediate city and preserving the quality of our community environment.

5. Procedure:

a. Introductory remarks should be read or noted on board.

b. Ask for volunteers or pick ten students who will be representing their interests - 1 moderator, 9 spokesmen.

c. Divide the remaining class into groups centered around each of the nine spokesmen to explore other reasons (in addition to those already on the position cards) to support the particular spokesmen's position.

d. Reassemble the class after 15 minutes of group discussion and have the spokesmen each state their position, formed from the position statement and any suggestions from the group discussion. This part of the activity could be completed in the first class period.

e. The following class period should open, once again, with the spokesmen stating their positions to the rest of the class.

f. Class discussion should follow to determine which policy they feel is best. Voting could take place to make a final decision.

g. The class may wish to extend their discussion from this simulation to their own community.

6. Discussion questions:

a. Who do you feel real-world planning, like with this issue, normally benefits? Was this the case with your planning session?

b. Does a decision to build a major expressway in a community lead inevitably to expanded growth? Is this a good thing for most communities?

c. What external costs does major construction place on a community? Who pays these external costs (as opposed to direct financial costs for actual construction)?

d. When should planning for major constructions be started? 1 year, 2 years, 5 years, etc. before construction?

e. Does your community have a major expressway running through or around it? If so, what types of planning do you think took place?

1. Who benefitted most from its construction?
2. Who benefitted the least?
3. What environmental problems do you observe that are directly related to the expressway?

f. If your community doesn't presently have an expressway in or around it, do you expect one to be built soon? What environmental considerations do you feel a new expressway in your community should take into account?

g. What suggestions do you have concerning the actual construction and technology of an expressway, such as, use of medians, entrances, and exits, and location?

Returnable or Throw-Away Bottles

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed: Making effective environmental decisions requires consideration of ecological, economic, political and social and technological aspects of the problem.

3. Time: one week

4. Materials: Room for storing bottles
   Charts (6) -- 1. bottle collection data
   2. glass manufacture
   3. economic influences
   4. political pressures
   5. negative and positive social implications
   6. technological developments
   Pencils

5. Procedure:

   a. Have students in the class collect for one week throw away bottles used only in their homes.

   b. Count the total number of bottles after one week and using class results as an average, complete the following chart.

	per family	per class	per community
Number of Throw Away Bottles			

   c. In studying the following chart on glass manufacture, students should concentrate on resource and energy consumption.

	RETURNABLE	THROWAWAY	RECYCLING
mining	990	5,195	3,636
transport	124	650	360
manufacture	9,673	42,559	42,559
transport	361	1,895	1,895
bottling	6,100	6,100	6,100
transport	1,880	1,235	1,235
collection & disposal	89	468	0
collection & sorting	0	0	6,451
recycling	0	0	360
TOTAL	19,217 BTU's/gal.	58,102 BTU's/gal.	62,596 BTU's/gal.

Figures are for 16 oz. bottles that make eight round trips if returnables.

On this chart, where are energy and resources lost?

d. On the chart below have students add as many arrows as possible showing occupational and economic influences of both types of bottle manufacture.

Returnables → Job created to collect bottles

Throw Aways → Job created to make new glass

e. For the political aspects of returnable bottle legislation, study the problems encountered in Oregon. Also have the students add as many arrows as possible indicating what pressures would be exerted on a congressman for his vote. Be able to explain why the arrow was added.

Congressman ← Glass manufacturers

Have students write to their congressman to find his/her stand on the bottle issue.

f. Students should list the positive and negative social implications of both returnable bottles and throw away bottles.

Positive	Returnable	Negative

Positive	Throw Away	Negative

g. List any technological advances, machinery, etc., that have resulted or would result from the use of returnable or throw aways.

Returnable

Throw Away

6. Discussion questions:

   a. How do technological advances in either returnable bottle or throw away bottle manufacture influence the environment and the economy?

   b. From the number of bottles collected in class, are throw away bottles a problem in this community?

   c. It has been stated that a family will save $25 per year by using returnable bottles. Explain how this would be.

   d. Where is your nearest bottle recycling center?

   e. What would this world be like without glass?

   f. Each student should ask five neighbors to clean and save throw away bottles for three weeks at which time the student will collect them. Analyze the responses received by the students as an indication of social attitude.

   g. Where does glass come from, what resource?

7. References:

Swatek, Paul, The User's Guide to the Protection of the Environment. New York: A Friends of the Earth/Ballantine Book, 1970. pp 126-8.

Oregon Experiment Newsweek 83: 90 April 15, 1974

Can Ban Newsweek 83: 79-80 April 2, 1974

Where the Future Works Newsweek 83: 49-50 Jan. 7, 1974

Deposit on Litter Nation 213: 6 July 5, 1971

Clean Town, U.S.A., movie

Junior High

Carol H. Zale

Study of Pesticides

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed: Effective environmental decision making includes considering carefully the pros and cons of all possible alternative solutions, policies and actions, and studying the trade-offs among them.

3. Time: This will require approximately fourteen days spaced throughout the growing period of the plants. This experiment should be done in the spring of the year.
   day 1 - plant tomato seedlings
   day 2-11 record any changes in the plants
   day 12 compile data and discuss your feelings forming personal judgement
   day 13- form groups with those students who felt as you did and discuss reasonings.
   day 14- debate with the class your feelings

4. Materials:
   - a. Large planter
   - b. tomato seedlings
   - c. grubs (these can be purchased at the Carolina Supply House)
   - d. any commercial pesticide that will kill grubs
   - e. Data sheet

Growth Chart for Tomato Plants

List any notable differences between the control group and the experimental group.

Plants with pesticides	Plants without pesticides
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	

5. Procedure:
   - a. Plant tomato seedlings in planter.
   - b. Have the students spray the plants in the control group with the pesticides and introduce the grubs into the planter.
   - c. Each of the students will record their observations on the next nine designated days of any changes that occur in the plants.
   - d. The students should compile the data and discuss it, trying to form a judgement.

6. Discussion Questions:
   a. How did the pesticide effect the control group?
   b. How did the grubs effect the experimental group?
   c. Can you think of any long range effects that may be encountered by society from the decision that you arrived at during the experiment?
   d. Do you feel that your decision is absolutely correct for all of society? Why?

Junior High

Glen Erickson

Investigating An Issue

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed: Effective environmental decision-making includes considering carefully the pros and cons of all possible alternative solutions, policies and actions, and studying the trade-offs among them.

3. Time: Indefinite, depending on particular issue selected.

4. Materials: Introductory remarks: Environmental decisions occur every day, in our personal lives and in communities and society at large. It becomes extremely difficult for any one person to become knowledgeable concerning all or most of the decisions that are made in our communities. However, developing a method for obtaining and evaluating information and opinions about an issue, along with possible alternatives provides us with a strategy for solving or suggestions for solutions to most of the environmental problems we face. This activity is designed to suggest possible ways of developing this strategy for finding solutions to environmental problems.

   a. Telephone and Telephone Directory
   b. Pens, or pencils, and paper
   c. Outside speakers, if possible

5. Procedure:

   a. Select an issue of local environmental concern that has been covered, or is being covered by local media (newspapers, radio, television).

   b. Have class discuss and list on board all information that they have themselves concerning the selected issue.

   c. Divide the class into groups to seek out information from local sources, such as:

      (1). Local newspapers
      (2). Local radio and television stations
      (3). City Government Commissions and Departments (Planning Commission, Trafic Control, Drain Commission, etc.)
      (4). Local Citizen Interest Groups
      (5). Local Ecology Center
      (6). Local major industries and businesses
      (7). Local School System officials
      (8). Congressmen or women, and Councilmen and women

d. After each group has selected a specific information source to investigate, discuss the various ways for each group to use in their investigations, such as:

(1). Use the telephone. When using the telephone, make clear with an outline, the main points you are interested in discussing with a representative for the particular information source you are calling. Mention your particular interests and key questions and ask for an interview time, either in person or on the telephone. If possible, arrange for that representative person to come and talk with the class.

(2). When looking for information from a newspaper, be critical. That is, be aware that newspapers align themselves toward certain groups of people: rural, urban, businessmen, political parties, ... and therefore present information with opinions favoring their readership. If possible, read more than one newspaper which has information relevant to your issue, and try to see who the readership for a particular newspaper is.

(3). Write letters, if time permits. Ask for specific information from the person or group you are writing. This makes it easier for them to give you relevant information by a particular time.

(4). Whenever possible, meet with people directly. You can usually get the best information this way. Allow yourselves to be flexible and open-minded when you speak with someone. Remember, you are seeking information from someone, so be a patient, but questioning listener.

(5). If your issue is being considered in a local meeting, such as a school board meeting, city council meeting, public hearing (many environmental issues are openly discussed in local public hearings), try to send a representative from your class to that meeting.

(6). When looking at radio and television stations, first call them and see if they have anyone reporting or editorializing on that issue.

(7). Whenever you speak with anyone about your selected issue, ask them if they know of other people or groups you might contact to gain more information about your issue. People-contacts often prove to be the most informative sources.

e. As groups obtain information, compile an outline on which they can jot down the contacts they've made and a brief statement or two about the information the group obtained.

f. The length of any issue-investigating activity in flexible and can take a few days to a week or longer, especially if letters are written.

g. After most or all of the investigative work is completed (it is best to set a date by which every group will complete their initial information investigations), outline on the board all the possible alternatives to the problem selected.

h. Then have a representative for each alternative present the pros and cons, as they see them, of their particular alternative. A very good way to do this is to have the class act as a council meeting to decide upon which alternative appears best for your community, county, state, etc.

i. Bringing in outside speakers to your class at this point would be very valuable.

j. Have the class decide upon the best alternative and possibly write a letter to the Editor, or to a local Planning Commission, School Board, City Council, etc. to voice your concern about the issue you have selected.

6. Discussion Questions:

   a. What sources of information did you look at?

   b. What people did you speak with?

   c. Can you identify the people that a newspaper, radio or television station aligns themselves to — their constituency?

   d. What groups of people have the best power in making a decision? Low-income families, workers, farmers, children, etc.?

   e. What groups have the most power in making decisions about your particular issue? Businesses, industries, professional people (doctors, lawyers, scientists, etc.), Planning Commission, City Council, etc.?

   f. Did you have an opinion about your selected issue prior to your investigative work? If so, did that change during this activity, and how?

   g. Do you feel that this particular issue is being considered fairly in your community, by viewing all alternatives and the consequences of each alternative, or do you feel this issue is being decided in favor of one group of people over other groups?

Junior High

Tom Derda

Characteristics of a Contained Environment

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed:

   Individual or personal decision making involves one's feelings, attitudes, and values.

3. Time: Two or Three Hours.

4. Materials: (optional) Have displayed on the table the following items: radio, transistorized radio, items of food- (dehydrated rations), wardrobe items-picture of space suit, battery, green plant, large cardboard model of the spacecraft.

5. Procedure:

   a. Introduce the exercise by asking the following questions:
      1) What must be in the spacecraft when it leaves the earth?
      2) How can man survive in such a system?
      3) What transformation of energy must be made?
      4) How has science technology been able to adapt items to fit into the space home?

   b. The following three statements and questions should be typed and reproduced on the ditto machine.
      1) An environmental control system must be maintained on the spacecraft. The atomsphere must be similar to that on earth.
         a) How is this achieved on the spacecraft?
         b) Why is a higher percentage of oxygen used in the spacecraft?
         c) How does the crew know the supply of gases in the cabin?
         d) How is the oxygen stored?
         e) Why must the oxygen be kept cool?
         f) What is a supercritical system?
         g) Why must all available space and weight be carefully considered?

      2) As the crew consumes oxygen and food, waste products are produced.

         a) What are the waste products?
         b) Why must they be removed from the spacecraft?
         c) Why might a chemical compound such as lithium hydroxide be used on a space mission?
         d) What pollutants, other than human ones, might exist in the space capsule?
         e) How are these pollutants managed?
      3) Water and food are necessary for the spacemen.
         a) How is food stored? What does this conserve?
         b) How can water be obtained? How is storage space conserved when water is made by the power plant?
         c) When space is so limited, can human wastes be recovered and used?
         d) Where could food be grown to supplement the supply taken for the trip.
         e) What other supply would the green plant furnish?
         f) What happens to the heat and body perspiration? Odors?

c. Suggest that groups be formed, according to their special interests, to investigate and report their findings on the following topics.

   a) Devise a way to remove carbon dioxide from the cabin in longer space travels.
   b) Suggested ways to overcome the human aging process during very long space flights.
   c) Devise a way to reconstitute oxygen from water and carbon dioxide on long space flights.
   d) Investigate the possibility of taking green plants on space missions.
   e) Investigate the way astronauts keep fit in an enclosed cabin.
   f) Investigate the many by products which the space age has given us.
   g) Investigate a space station as a closed environment.
   h) Investigate a sea lab as a closed environment.
   i) Make a list of other small closed environments that occur here on earth.

d. Arrange again in groups. On large paper each group must draw up its own blueprint for a conserved spacecraft. Include food, water, oxygen, wastes, carbon dioxide, and energy in the contained environment along with two astronauts.

The teacher should then explain the situation of sending two such spaceships on a long journey to Mars. After landing, one ship is damaged and is unable to return to earth. The group must list all alternatives in returning all the astronauts to earth. Finally, only consider the possibility of returning all four men in one spaceship. All necessities and systems must be altered to accomplish this task. Discussion on the importance and conservation of air, water, fuel, food, energy, and equipment follow, and a group consensus must be achieved.

6. Discussion Questions:

   a. How is the earth like a spaceship?
   b. Are there ways you see that the school operates as a closed system? Name these.
   c. Reflect on our own community and its resources as a closed environment.
   d. Examine the idea of recycling used objects on earth.
   e. Discuss some of the world's philosophies on pollution, energy, and natural resources.
   f. Just what are the most important items on this planet?

7. References:

   a. Operating Manual for Spaceship Earth by Buckminister Fuller
   b. other environmental books by Buckminister Fuller.
   c. Other environmental books by Noel McInnis.
   d. Simulation Game distributed by the Coca Cola Company called "Make Your Own World" and "Spaceship Earth".

Is What You Decide What You Believe?

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed: Individual or personal decision-making involves one's feelings, attitudes, and values.

3. Time: 1 hour

4. Materials: blackboard, paper, pencils, and ditto.

5. Procedures:

   a. Make up two dittos with the following questions, plus any you might think of:

      (1) This group of questions on one ditto:

         (a) What kind of car would you like to own someday? Why?

         (b) What kind of job do you look forward to having someday? Why?

         (c) Do you feel each one of us has a certain amount of responsibility to try to live a life-style that is concerned with protecting and improving the quality of life for everyone, including people not yet born: your children, and their children? Why or why not?

         (d) Is going to school important to you? Why or why not?

         (e) How might schools change to make you feel better about going, than they do now?

      (2) This group of questions on one ditto:

         (a) Imagine you knew someone who could get you a summer job that paid good money, simply because you knew that person. You don't really need the job, but it would allow you to buy many things that you wanted. You find out about another person who is qualified for the job. He has a family to support and needs the money. He would be able to work all year on the job, because he isn't going to school. What would you do, and why?

         (b) How do you feel about the population problem? Does it exist? Is it very important, and why? Is it right for some people to control their family size, and not right for other people? Who is it right for, and who is it not right for, and why?

(c) Today (1974) there exists extreme drought conditions in Africa (the countries in and directly south of the Sahara Desert). The people hardest hit are nomadic (traveling tribal groups which base their whole way of life around their cattle herds. Until recently there was not enough water and grass for the cattle and consequently many cattle and many people have died. Recently, other countries have sent in people with equipment to dig very deep water wells into a huge underground lake. Now at these wells there is plenty of water for everyone and their cattle. Since then, the people near the wells increased their cattle herds, and now there is not enough grass for all the cattle. Water is again scarce. Were the other countries right in digging the wells? Should wealthy countries give them money to build huge irrigation systems to feed many times more cattle than ever before, allowing the people in this region to increase their population greatly?

(d) Would you rather be a person or a rock? What is special about being alive? Is it better to be a living person, than to be another kind of living creature? Or is it the same?

b. If you like you could write each question seperately on the board before breaking into class or group discussions.

c. After having the students answer the first set of questions, have them break into groups of 5 or 6 to discuss their responses and their reasons.

d. Now have the class answer individually, again, the second set of questions.

e. Class discussion should follow, sharing out different students' feelings and responses (you might want to first discuss this set of responses in groups, before going into a whole class discussion) to this second set of questions. Comments about the first set should also be encouraged.

6. Discussion Questions:

a. Do you think a person's feelings, attitudes, and values play an important role in arriving at decisions?

b. Is it important for a person's behavior or actions reflect that person's feelings, attitudes and values?

c. Do you think a person should try to be consistent in his or her actions? Why?

d. Is there any good in expressing your feelings and thoughts with others, with the class?

e. Is it easier to express yourself in writing, in talking with one person, a group, or the whole class?

Junior High

Glen Erickson

Laws and Ordinances: Are They Necessary?

1. Concept to be developed: **Environmental Decisions**

2. Understanding to be developed: In many cases it is necessary to change the law in order to prevent environmental abuses.

3. Time: 2 hours: 1 hour field trip
   1 hour discussion and comparison

4. Materials: Introductory remarks: Many times businesses and industries interested in profits, and consumers interested in convenience, do not consider the environmental abuses caused by their actions important enough to make them change their behaviors voluntarily. However, for the greater benefit for all people, certain actions by businesses and industries and individual people which are detrimental to the quality of everyone's lives must be prevented through laws designed to increase the quality of people's lives in general.

   a. Cameras (optional, but recommended)
   b. Telephone Directory and telephone
   c. Blackboard
   d. Magazines

5. Procedure:

   a. Go on a field trip to a local business district along a major street in your community (wherever drive-in hamburger places are is a good place). If you have access to Instamatic cameras, have the students take pictures of the different types of signs (advertising) they see. Especially try to take pictures looking down the road (as if you were traveling along the road).

   b. Have the students make a list of the different signs, such as:

      (1). Large signs near the road
      (2). Large signs away from the road
      (3). Especially distracting or irritating signs
      (4). Signs on buildings (flush with the building)
      (5). Number of signs for one business
      (6). Especially appealing or non-distracting signs

   c. Have the students find pictures from magazines, or ideally take the pictures themselves, of a street where signs are limited in size, number, closeness to road, and in general, functional but not distracting.

   d. Let the class discuss the visual appeal of both types of streets, thinking about safety and aesthetics.

e. Contact your city government to find out if any sign ordinances are enforced by your community.

   (1). If your city has such an ordinance, what violators of the ordinance can you witness?

   (2). If your city has no sign ordinance, what suggestions for such an ordinance can you make?

f. This activity can be designed around many other issues, like:

   (1). Air pollution controls
   (2). Water pollution controls
   (3). Noise ordinances
   (4). Soil erosion ordinances
   (5). Non-returnable containers controls (such as in Oregon)

6. Discussion Questions:

a. Why do you think signs are bigger and bigger, with more and more lights (think of Las Vegas)?

b. Do you think businesses will voluntarily limit the size, number, and locations of their signs? Why? Are laws and ordinances the only way of limiting signs?

c. Think about traveling on rural roads compared to traveling on streets lined with businesses. How do you feel about looking around? What are the most dominant things to see?

d. Do signs play any part in drivers becoming distracted or irritated when they drive?

e. What ways can people make traveling through a city more relaxing and less eye-straining, realizing that businesses want to advertise?

f. Without any city ordinance limiting signs, when do you think businesses will limit their signs (size and number)? Ever?

g. Observe how many billboards are along the street (or in your pictures).

   (1). Can billboards be appealing or aesthetic?
   (2). Are they safe?
   (3). Are they really necessary for businesses? Do you feel billboards deteriorate the quality of your environment?

h. Would one or two clear, simple, appealing signs be nearly as functional as several, large, neon signs for a business?

i. When does private advertising infringe on the public's right to a quality, appealing environment?

Junior High   Harry Tindall

A Bill to Ban Pesticides

1. Concept to be developed: Environmental Decisions.

2. Understanding to be developed: In many cases it is necessary to change the law in order to prevent environmental abuses.

3. Time: 5 days - day 1 - Discussion of danger of pesticides and possible
   need for a law. Film.
   day 2 - film.
   day 3 - discussion of legislative procedure and display
   illustrations (Here, time must be given for
   witnesses to prepare testimony--couple of days?)
   day 4 - simulation game (How many days depends upon how
   well the witnesses play the game.)
   day 5 - discussion.

4. Materials: reference materials on environment, films, drawing paper, colored pencils.

5. Procedure:

   a. As the dangers of pesticides are discussed as part of water pollution, the natural question is "How can we halt the widespread use of pesticides?"
      1. by education?
      2. by propaganda?
      3. by community pressure?
      4. by law?

      Let us assume a law strikes the class as the most fair and effective way. How do we get a law?

   b. Film: CHANGING THE LAW. Discussion.
      Question: How does a bill become a law?

   c. Film: STATE GOVERNMENT. Discussion. List the steps.

   d. Assign class illustrations of each step. Try for originality and cleverness.

   e. Display illustrations to class, comment and discuss meaning.

   f. Emphasize the fact that the real work of the legislature is done in committee. Explain how a committee operates in studying a bill and propose a simulation game for the class. After explaining the game (if necessary), students are to choose a role they wish to play from the following: (Use Watergate Committee as example)
      1. five to seven committee members
      2. three professors of Environmental Studies (from Universities of their choice)

3. two or three fruit growers
4. two or three corn growers
5. one lobbyist representing the Grange
6. one member from each of several conservation societies--the Sierra Club, Audubon Society, National Wildlife Society, others.
7. one official from "Great Lakes Fisheries"
8. one official from the Michigan Environmental Protection Agency
9. others--you may have to create some societies to get the entire class into this committee study
10. two newspaper reporters who will write some headlines about certain "hot" testimony presented to the committee
11. one T.V. newsman who will make a "report" after the hearings are completed.

g. The degree of success of this game will depend upon how seriously the members of the class play the game. They must combine "Homework" with charm and imagination. "Homework" means they are prepared with the answers to all sorts of things. They must not only know all aspects of the problem, but they must be particularly well versed on "their" side.

h. Find out what bills are before your legislature now regarding environment. Class members may wish to write some letters in support of or opposed to these bills.

6. Discussion Questions:

a. Getting a bill into a law is a long, arduous procedure that takes months and even years sometimes. What are the pros and cons of this snail's pace?

b. Why do communities have laws? How does a law differ from customs and mores?

c. Why is most of the work of the legislature done in committee?

d. Why is the committee chairman such a powerful position. Is there any way to get around him?

e. Suppose your pet bill is being stalled in committee. Is there any way that you, as a legislator, can pry it out to the full House?

f. Do you think the bill to ban pesticides was a good one? Why did DDT get banned a long time ago?

g. Why did the committee call in so many witnesses? Were both sides represented fairly? Can anyone testify before a committee?

h. Are new laws on environment the first priority in our legislatures? Should they be? Why is it difficult to get the legislature to move on environment as quickly as a bill, say, on raising the minimum wage?

i. What could happen to make the legislature move more quickly on environmental bills?

j. What are some environmental bills you would like to propose to the legislature at this time? Why?

7. References:

a. Introduction to Environmental Science, Phillips W. Foster.
Learning Systems Company, Homewood, Illinois, 60430.

b. Silent Spring of Rachel Carson. Film.
AV Center, Indiana University, Bloomington, Ind. 47401

c. Gardening Naturally, D.X.Fenten, Franklin Watts, Inc. New York, 1973.

d. Pests and People, Lawrence Pringle
McMillan Publishing Company, Inc. New York 1972.

e. Water Pollution, George Laycock
Grosset & Dunlap, Inc., New York, 1972.

f. Earth, the Great Recycler, Helen Ross Russell
Thomas Nelson, Inc., New York 1973.

Junior High

Christine Rowley
Barbara Rowley

Environmental Ethics

1. Concept to be developed: Environmental Ethics

2. Understanding to be developed. The earth's resources exist for all living things, not just man.

3. Time: 5 days day 1 - field trip
   day 2 - discussion
   day 3 & 4 - creative work
   day 5 - class presentation (may need more time)

4. Materials: Access to wooded lot and area with pond or creek.

5. Procedure:

   a. Field trip - walk around a wooded area and somewhere with a wildlife pond or creek. Students make note and list all living things that depend on 1) a tree for it's survival and, 2) a pond or creek for it's survival.

   b. Notice a tree in the school yard or backyard at home. Notice the different uses of the trees in the wildlife setting and in a domestic setting.

   c. Class discussion.

   d. Students may work together or individually. Each group is responsible for presenting by play, short story, T.V. program, poetry or song, the dependence of all living things on air, water and soil.

   e. Each student will present their project to the rest of the class.

6. Discussion questions:

   a. What different animals depend on the soil for survival?

   b. How does the soil depend on plants for fertilization and protection?

   c. What is the difference in the usefulness of a tree in the woods and one in a domestic setting?

   d. From all your information, how does mankind use the soil and water resources differently than plants and animals?

   e. What kinds of things must man do when using the soil and water to prevent their destruction?

Junior High

Pat Baron

Value Voting

1. Concept to be developed: Environmental Ethics
2. Understanding to be developed: The earth's resources exist for all living things, not just man.
3. Time: 1 day
4. Materials: List of questions
5. Procedure:
    a. Read aloud each of the questions in part d prefaced with "How many of you..."
    b. After each question have the students raise their hands if they vote yes and turn their thumbs down if they vote no. An undecided student should just cross his arms and any student who wants to pass should do nothing at all.
    c. The teacher should vote but wait a split second until most of the class has voted so as not to be an influence.
    d. Questions: "How many of you...
        1. would take the time to nurse a sick puppy back to health?"
        2. if given a horse, would spend 3 hours a day taking care of it?"
        3. would shoot an animal if you needed food?"
        4. would shoot a polar bear to have a nice fireplace rug?"
        5. would outlaw snowmobiles in parks because they scare animals and damage plant life?"
        6. think animals should be in zoos?"
        7. if you owned forested land, would sell it for $50,000 profit to a contractor who will cut down the trees for an apartment development?"

8. would shoot at an animal to see if you can hit a moving target?"

9. would give up half of your allowance for 3 months to help save the timber wolf from becoming extinct?"

10. if an area near you is to become either a wildlife refuge or an amusement park like Cedar Point, would want the amusement park?"

6. Discussion questions:

   a. Can homes be built without tearing down large numbers of trees? What is being done about this in the construction business today?

   b. What advantages are there to zoos?

   c. What disadvantages are there to zoos?

   d. What is the best type of zoo?

   e. Can man successfully share parks and countryside with animals and plants? Explain.

   f. Is man the only animal that kills for things besides food?

   g. What determines how your state is being developed in regards to homes, businesses, recreational areas, etc.

   h. What organizations can you name that try to help animals and plant life?

   i. What government agencies work to protect wildlife?

   j. Should off-shore oil drilling be allowed in order to give us much needed fuel even though an accident would damage much of the aquatic wildlife?

7. References:

   a. *Say Goodby* (movie).

   b. *Values Clarification*, New York: Hart Publishing Company, Inc., 1972. Sidney B. Simon, Leland W. Howe, Howard Kirschenbaum.

Life Style Study

1. Concept to be developed: Environmental Ethics.

2. Understanding to be developed: Certain life styles enable man to live as a complimentary part of the environment.

3. Time: 1 - 2 days for gathering data, 1 day for discussion.

4. Materials: paper and pencil.

5. Procedure: (This activity should follow a unit on ecological problems)

   a. Discuss similarities in life styles among members of class and diverse reasons for their choices.

   b. Each student lists specific ecological problems that he sees happening around him at school (or at home).

   c. Students individually or in small groups list all the pros and cons they can think of for the stated problems.

   d. Students determine (individually) whether conditions 1) should continue, 2) should be changed completely, 3) should compromise in some way and why.

   e. Have students form small groups to share and discuss written problems alternatives, and decisions.

   f. Have each student group choose one situation and role play the situation and the consequences of that decision.

   And/Or

   Discuss in large group similarities and diversity of the decision.

6. Discussion questions:

   a. Are your life styles all the same?
   b. If there are differences, what are the reasons for those differences?
   c. How does your life style affect your decisions?
   d. How do your decisions affect your environment?
   e. Do you feel that any part of your life style should be changed?
   f. If you feel there should be changes, how could you change it?

Junior High

Pat Baron

Choosing a Life Style

1. Concept to be developed: Environmental Ethics.

2. Understanding to be developed: Certain life styles enable man to live as a complimentary part of the environment.

3. Time: 3 days -- 1/2 day the week before the project to write down outdoor values.
   1/2 day to compile list of items to sell.
   1 day to do project and compile data.
   1 day to interpret data.

4: Materials: Paper, pencil.
   List of items to sell (1 copy per student).
   Price list for these items (1 copy per student).

5. Procedure:

   a. Have each student spend 20-30 minutes listing ten things he/she likes best about the outdoors. (Not things they like to do outdoors.) Example: I like the feel of the sun: I like the room to play baseball.
   Collect and save for later.

   b. One week later spend 30 minutes with students making a list of anything they want--example: 10 speed bike, stereo, etc.

   c. Make copies of this list of items and give each student one.

   d. Set up four stores in your room.
   Store #1 will be selling spring and summer recreational equipment.
   Store #2 will be selling fall recreational equipment.
   Store #3 will have the winter recreational equipment.
   Store #4 will be a surplus store carrying anything not found in stores 1,2, and 3.

   e. Each store will be given a price list for the items it is selling.

   f. Assign 2 students to be the storekeepers at each store.

   g. Inform the rest of the class they have $2,000 to spend at these stores and they can buy whatever they want.

   h. As the students move freely from store to store whenever they desire to purchase an item, have the storekeeper circle that item and put the price next to it.
   A student's list might look as follows after two purchases:
   10 speed bike
   [✓ skiis] $150.
   sewing machine
   stereo
   [✓ tennis racquet] $70.

i. Students will continue to "buy" items until they have reached a total of $2,000.

j. Pass back the list of outdoor values compiled by the students the week before.

k. Have each student write a short paper comparing the items he bought to those outdoor features he best likes. The students should consider if, how, and to what extent their choices would disrupt any of these outdoor values.

6 Discussion Questions:

a. On your list of purchases, which item consumes the most energy? The least energy?

b. Pick any three items you bought and list what raw materials make up those items.

c. Are any of your items bio-degradable? If not, how will they be disposed of?

d. For each item you bought, determine if it is a cause of air pollution, soil pollution, and/or noise pollution.

e. What way of life would blend in best with nature?

f. What way of life would most disturb nature?

g. On the following scale, where would you place your way of life? Explain.

Little Disruption of Nature ________________________________ Much Disruption of Nature

Section II

Junior High School Skill Developing Activities

87/88

SECTION II

Introduction to Skill Developing Activities

The development of problem solving skills is essential if students are going to actively participate in environmental problem solving as responsible citizens.

Eight skills have been identified as being essential to the environmental problem solving process and for each of the eight skills, skill developing activities have been designed for each of the following grade categories: early elementary (K-2); middle elementary (3-4); upper elementary (5-6); junior high; and senior high.

The eight problem solving skills are the ability to:

1. listen with comprehension;
2. recognize environmental problems;
3. define environmental problems;
4. collect information;
5. organize information;
6. analyze information;
7. generate alternative solutions; and
8. develop a plan of action.

After becoming acquainted with the following skill developing activities, you may want to develop some of your own, keeping in mind that they should be designed to be integrated into and coordinated with your existing curriculum rather than be used as units by themselves.

Awareness

1. Skill areas to be developed:

    a. The ability to recognize a problem.

2. Time involved: 30 min.

3. Material needed: paper and pen

4. Recommended procedure:

    a. Each student should draw a line across his paper.

    b. Make 8 marks, 1/2" apart across the line.

    Example:

    c. By each mark write in a pollution problem you contributed to in each grade.

    Example: 1st grade - waste paper.

    d. Do this for grades 1 through 8.

    d. On the other side of your paper, mark four lines across one horizontal line 1" apart. This represents grades 9 through 12.

    Example:

    e. Now write in four pollution problems, one for each year. (One that may be most common for that class).

    Example: 11th grade - driving a car.

    f. Below the line write four ways this pollution problem could be prevented or lessened around the school.

5. Discussion questions:

    a. What are some of the problems we contribute to?
    b. What can we do to help lessen them?
    c. Who is the real problem?
    d. What are some of the problem in High School?

Water, Water, Everywhere. . . .

1. Skill area to be developed:

   a. Ability to recognize a problem.

2. Time involved: 30 minutes (15 minutes per phase).

3. Materials needed: Six information cards.

   a. Card #1-This opening statement to be read to all members of the Group.

      Chlorine, aluminum sulfate, lime, and soda ash are needed to purify drinking water in Toledo.

      The date is February 10th.

      - Federal money is available for water plant enlargements.

      - Natural purifyers are sunlight, time, sedimentation, and natural filtration.

      Some of the information provided may not be needed.

   b. Card #2

      - Many cities are competing for the limited supply of chlorine and soda ash.

      - Water use is heaviest on Monday; lowest on Sunday.

      - Water useage increases 4% each year.

      - 2 1/2 tons of soda ash are needed to purify 80,000,000 gallons of water.

      - The suburbs and city are expanding at the rate of 1,300 new homes each year.

      Some of the information provided may not be needed.

   c. Card #3

      Plenty of filtering sand is stockpiled.

      Toledo supplies water to the suburbs.

      Sewage plant workers have threatened to strike if the volume of sewage increases this year.

Soda ash presently costs $23/ton and is increasing.

The supply of soda ash is expected to be adequate by mid-1975.

Some of the information provided may not be needed.

d. Card #4

Rainfall averages 10 inches in May, 8 in June, and 6 in July and August.

Chlorine is obtained by an electrical process requiring much power.

Big water users - schools - are not open during the summer for the most part.

Heavily polluted water may require chlorination before and after filtration.

Some of the information provided may not be needed.

e. Card #5

300 lbs. chlorine is needed to purify 40 million gallons of water.

Sewage-nourished algae blooms may block Toledo's water intake pipes in the lake.

80,000,000 gallons of water are produced on an average day during the spring and fall months.

Soda ash can only be supplied at 50 tons per month.

Some of the information provided may not be needed.

f. Card #6

105,000,000 gallons of water are used on an average day during the summer months.

The city has ample rock salt to soften water on hand.

Toledo can store 43,000,000 gallons in various tanks.

Few wells exist in the city anymore.

25,290,000,000 gallons were processed by the water treatment plant last year.

Some of the information provided may not be needed.

4. Recommended procedure.

    a. Form the class into groups of six.

    b. Pass out the cards to each group. (one card to each member of the group)

    c. Give the following directions for the exercises:

        1. Participants may not show their card to anyone.

        2. Participants may read the information on the card to anyone in their group.

        3. Some of the information on the cards may be irrelevant.

5. Discussion questions:

    a. Based on the information provided, what do you see as one of the major environmental problems Toledo faces?

    b. What can be done to remedy it?

Junior High

Dave Sandys
Dick Sandys
Jim Obenour
Ron Gardner

Beep, Tweet and Zoom

1. Skill areas to be developed:
    a. The ability to listen.
    b. The ability to collect data.
    c. The ability to organize data.

2. Time involved: 75 minutes.

3. Material needed: Battery tape recorders.

4. Recommended procedure:
    a. Form class into groups, size depends on the number of tape recorders.
    b. Discuss organization of project.
        1. Each group will take a recorder to a different corner or area of their environment (corner of main street, corner of school block, corner of park).
        2. Each person will write down all sounds he hears while tape is recording for a ten minute period.
        3. After all groups have returned make a list of all sounds they heard either by groups of noises (car noises, bird noises) or by number of individual noises (36 car engines, 4 car horns, 3 car mufflers).
        4. Have the class listen to sections of tapes to check students' ability to listen or have each group listen to their entire tape to check their ability to listen.
        5. Organize data into a graph to show relationship of noises.

5. Discussion questions:
    a. How well did the students listen?
    b. Did the tape recorder pick up sounds the students missed? Why?
    c. Is this a good survey of noises in our outdoor environment?
    d. Would the results have been different at other times or places?
    e. How do these noises affect our lives?

Junior High John T. Murnen

Pictures Tell The Story

1. Skills to be developed:
    - a. The ability to recognize a problem.
    - b. The ability to define a problem.
    - c. The ability to generate alternative solutions.
2. Time involved: 45 minutes.
3. Materials needed:
    - a. Pictures, which show a problem, cut from magazines. These may be secured by the students or supplied by the teacher.
    - b. An opaque projector to project the pictures on a screen (optional) or the pictures may be passed among the students.
    - c. Pencil and paper.
4. Recommended procedure:
    - a. Project the pictures on a screen or pass them around the room.
    - b. Ask the students to number their paper to correspond to the numbers on the pictures.
    - c. While viewing the pictures, have the students answer the following questions:
        1. What problem does the picture suggest to you?
        2. What are several solutions to this problem?
    - d. Give the students three minutes on each picture.
    - e. When the list has been completed, view each picture again, and discuss and compare the alternatives.
5. Discussion questions;
    - a. Could there be any other problems suggested by these pictures?
    - b. What do you suppose caused these problems?
    - c. Would other problems be created by the solutions that were suggested?
    - d. Would people be willing to sacrifice some comforts to solve these problems?

Upper Elementary and
Junior High

Ervin Doman

Area of a Cube

1. Skill areas to be developed:
   - a. Ability to recognize solutions.
   - b. Ability to find alternate solutions.
   - c. Ability to work with group.
2. Time involved: depends on grade level.
3. Materials needed: Solution cards, cube, centimeter ruler, ruler.

a. Solution Card #1

Find the area of a cube.

You may not use a ruler.

You may not find the area by measuring all six sides of the cube.

Try to find two alternate solutions in finding the area of a cube.

b. Solution Card #2

Find the area of a cube.

You may not use a centimeter ruler.

You may not find the area of a cube my measuring one side and multiplying by six.

Try to find two alternate solutions in finding the area of a cube.

c. Solution Card #3

Find the area of a cube.

You may not use the estimate procedure.

You may not take the cube apart and measure to find the area of a cube.

Try to find two alternate solutions in finding area of a cube.

d. Solution Card #4

Find the area of a cube.

You may not use your index finger or any other artificial instrument as a unit of measure even if you know its measurement.

You may not find the area by measuring three sides and multiplying by two.

Try to find at least two other alternate solutions in finding the area of a cube.

4. Recommended procedure:

   a. Form groups of 4 students.
   b. Provide group with a cube ruler and centimeter ruler.
   c. Pass out cards to each member in the group.
   d. Give the following directions for the exercise:

      1. Cannot solve problem with method or unit of measure on card. Must find alternate solution.

      2. Each group try to have two alternate solutions to the problem.

5. Discussion questions:

   a. Did all or part of groups use instruments to solve problem?
   b. How was decision to the solutions derived?
   c. Was a certain student dominate because he was good in math?
   d. Were all in the group able to contribute a solution or help in a solution as a group?

Junior High

William B. Stapp
Talbert B. Spence

Building Power (Coalitions)

1. Skill areas to be developed:

   a. The ability to define an issue.
   b. The ability to recognize the central issue of a problem.
   c. The ability to develop a power base.
   d. The ability to communicate clearly.

2. Time involved: 40 minutes.

3. Materials needed: none.

4. Recommended procedure:

   a. Have students count off by two's.

   b. Have all the students who are number "ones" move to the front of the room and give five minutes to decide on a group position or approach to the issue of Urban Mass Transportation within the present energy crisis.

   c. All number "two's" are assigned to represent an organization concerned with the energy crisis (e.g. movement for economic justice; environmental policy center; Model Cities Neighborhood Association; United Urban Transportation Association; Community Transportation Union, etc.

   d. A sign is placed on the chest of each number two noting the organization he represents.

   e. The "one's" are then given 10 minutes to obtain a commitment from one or more number "two's" to join their side. Two's need not commit themselves to any group.

   f. The new teams take 5 minutes to firm up or clarify their position more strongly ("two's" can break off from coalitions and form a group of uncommitted "two's").

   g. The coalition groups ("one's" and "two's" try to convince the uncommitted "two's" to join their coalition for 10 minutes.

5. Discussion questions:

   a. How did leadership unfold during the activity?

b. How was the membership of coalitions formed?
c. How was power formed by coalitions?
d. How did your group decide on your persuasion arguments?
e. How were decisions made?
f. Was there real or ritualistic listening during persuasion arguments?

Junior High

David H. Sandys
Richard B. Sandys
Ron Garner
James D. Obenour

An Electrical Survey

1. Skill area to be developed:
    a. The ability to collect data.
2. Time involved: variable (as a homework assignment)
3. Materials needed:
    a. A survey form:

<table>
<tr><td colspan="3">Identify all the things in your home that use electricity and put them in the appropriate categories below.</td></tr>
<tr><td>1. We couldn't do without</td><td>2. Could do without with some difficulty</td><td>3. Are really not necessary</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

4. Recommended procedure:
    a. Give each student a survey form.
    b. Ask them to take home the form and place each electrical appliance they find around their house in the column they feel is appropriate.
    c. Bring the form back the next day.
5. Discussion Questions:
    a. How many electrical uses did you list in column 1? What did people do before electricity was used to power these appliances?
    b. How much electricity does your home use in a day, month, year? How can you find out?
    c. Make a list of as many PRACTICAL ways you can think of to cut down on electrical consumption in your home. Try them to see if they work.

Junior High

Leslie Green
Charliemae Rose
Bill Mirick

Solid Waste Reduction and Removal

1. Skills to be developed:

   a. The ability to collect data.

2. Time involved: one week (5 class periods)

3. Materials needed:

   a. Map of school and grounds.
   b. Filmstrip cassette or movie on solid wastes.

4. Recommended procedure:

   a. The first class period should be used as an introductory session. A movie or filmstrip could be shown to initiate ideas and give the students some background information. Follow this with a discussion of the kinds of solid waste and and their sources around the school.

   b. Have students divide into groups. Each group should select one type of waste and determine its sources at the school.

   c. The collected data should be discussed and compiled within the the groups. (Some data ideas are: location of trash collection, amounts of trash and times of pick-ups, sources of trash, methods of disposal, use of disposable materials, recycling).

   d. Each group should submit to the class a written summary of its data and one or two practical means of lessening the amount of waste. They may also have ideas about getting some of the wastes to recycling centers.

   The groups can send their proposals to the appropriate person in the school.

5. Discussion questions:

   a. Are there comparable waste problems in your homes or neighborhoods?

   b. How can you convince people to use returnable bottles rather than cans and throw-away bottles?

Richard Sandys
David Sandys
Tom Garner
Jim Obenour

This Is Me

1. Skill area to be developed:
   a. The ability to collect data.
   b. The ability to organize data.
2. Time involved: two class periods
3. Materials needed
   a. Pictures from magazines, newspapers, and other sources.
   b. Glue
   c. Sheet of thin cardboard or heavy construction paper.
   d. Scissors
4. Recommended procedure:
   a. Cut from magazines and other sources pictures which represent how you see yourself. These pictures might include what you like or dislike in the way of food, sports, etc. Where you live, what you want to be, what you are, where you have traveled.

   b. Make a collage out of these pictures. When gluing these pictures be sure to overlap them and cover the entire surface.
5. Discussion question:
   a. What do these pictures tell about you?
6. Variations on the same project:
   a. Do a collage entitled: A Famous Person, or the U.S.A., or Pollution or The City.

Blanche Edelman
Doris Jones
Demitra Balmer

The Numbers Game

1. Skill area to be developed:

    a. The ability to organise data.

2. Time involved: 30 minutes

3. Material needed:

    a. Envelope with 4 sheets of numbers - all alike.

    Sheet (1) - Pick out all the number sets which contain any zero's and list them. Arrange in order, smallest to largest.

12456
39809
5432
47001
430
46
3178
14603
4692
50000
220
809
7486
27806
4110
6892
42701
26
892
1010
46055
10
767
2302
45507
403
1401
34
500

991
41762
80
2
520
2210
909
406
111
883
2071
103
706
2006
150
525
710
1140
33012
13021
5001
6708
38426
9874
27954
5740
805
207
23035

13572
5862
6700
306
880
600
456
333
12340
21033
37071
16060
15000
672
542
609
550

b. Sheet (2) - The same 76 number sets are on this sheet, but directions are: List all even numbers. Arrange in ascending order.

c. Sheet (3) - Same numbers as above.

Directions: List all numbers which have double or multiple of same digits. These may be zeros (Ex. 40706,333) or any other number. Arrange these in ascending order.

d. Sheet (4) - Same number sets.

Directions: Organize the entire set of numbers on the sheet according to size, list from smallest to largest.

4. Recommended procedure:

a. Form the class into groups of four.

b. Give each group an envelope containing the 4 sheets with directions.

c. Give the following directions:

1. Each member of the group will take one sheet and follow the directions on that sheet. If any member of the group finishes before others, he can help any other member complete the task.

When the group has finished the individual assignment, the one who has the complete list arranged in ascending order will read the numbers. Each of the other members of the group will check off and O.K. orally, that number from his list as the number is read. If two or more people claim the number, such as 400 would be claimed by all three; the reader of the master sheet will place a "3" before that number. If two people claim it, a "2" will be placed in front of the number. If only one claims it, then a "1" will be placed before the number. When the numbers 1, 2, and 3 are totaled, list can be checked for accuracy, there should be 36 "1's", 25 "2's" and 15 "3's".

5. Discussion questions:

a. Did you work well together as a team?

b. Did you discover any method to help you arrange your numbers according to size? If so, could you share it with the class?

c. Did you feel any pressure to complete your part of the task before the others completed theirs?

d. If you needed help in completing your part did you mind getting help from another member?

Blanche Edelman
Doris Jones
Demitra Balmer

C E D A B

1. Skill area to be developed:

   a. The ability to organize data.

2. Time involved: 30 minutes

3. Material needed:

   9 x 12 manila envelope containing 5 small envelopes, each is marked with a letter of the alphabet - A; B; C; D; E;

   a. The envelope with letter "A" contains 9 cards, marked AC; AB; AD; ABC; ACE; ABE; ADEB; AECD; ABCE;

   b. Letter "B" envelope has the following cards:- BD; BC; BE; BCD; BDE; BAC; BCDE; BACE; BADE;

   c. Letter "C" envelope has the following cards:- CE; CD; CA; CEA; CBD; CAB; CDEB; CABE; CADE;.

   d. Letter "D" envelope has the following cards;- DC; DE; DB; DEA; DBC; DAB; DBCE; DCBA; DECA;

   e. Letter "E" envelope has the following cards;- EA; EC; ED; EAB; EBD; ECA; EABC; ECDA; EBCD;.

4. Recommended procedure:

   a. Form the class into groups of five.
   b. Give each group a large envelope containing the five smaller envelopes.
   c. Give the following directions for the exercise:-

      1. Each member of the group is to take one small envelope and be responsible for the listing of the letter found on the outside of his envelope.

      2. After all the cards in the envelope have been recorded, sort cards through by second letter. (Ex. A$\underline{C}$, A$\underline{C}$E, A$\underline{C}$DB)

      3. Exchange cards using 2nd letter thus giving appropriate cards to member assigned to that letter.

4. Each member will then tally the new cards. Do not record a card if the letters it contains have already been recorded in another sequence.

5. Sort cards according to third letter. These cards are passed to tallier of that letter. All two letter cards are retained.

6. After recording sort for fourth letter. Pass to appropriate tallier. Retain cards with three letters.

7. All cards having been passed and recorded, each member now tallies the number of recordings he or she has made.

8. All those with letter

A should have 15
B " " 13
C " " 14
D " " 14
E " " 14

5. Discussion Questions:

a. Did you have any difficulty in your group in sorting and passing cards?

b. Did your group work well together?

c. Can you think of any easier method of sorting or tallying this information?

d. Did someone in your group assume the responsibility for keeping things going? If so, how did this come about?

e. How could you check to make sure you had not missed any cards which you should have reported?

A's Tally

A
AC
AD
AE
ABC ABD AED
ABE
ACE
ABCE ACDE
ADEB ABDE
ABCD DCBA

15

D's Tally

D
DB DA
DC
DE
DAB BDE
DBC
DEA
DBCE CDEB
DCBA ADEB
DECA

16

B's Tally

B
BC
BD
BE
BAC BDE
BCD DAB
BAE
BACE
BADE DCBA
BCDE

13

E's Tally

E
EA
EC CE
ED
EAB
EBD DEA
ECA
EABC
EBCD ABCD
ADEB
ECDA

14

C's Tally

C
CA BC
CD
CE
CAB
CBD DBC
CEA
CABE ABCD
CDEB

14

Tim Kardatzke
Don Hellinger
Tim Krone

Gasoline Mileage and Speed

1. Skill area to be developed:

    a. The ability to analyze data.

2. Time Involved: 30 minutes.

3. Materials needed: Each student should be given a paper on which will be the following data table to be completed with the use of a mileage log from the map of Ohio.

Average Speed	Trip	Miles traveled	Gallons	Miles per gallon
70 mph	Toledo to Dayton	(153 miles)	13.9	(11)
50 mph	Dayton to Cincinnati	(55 miles)	3.1	(17.75)
65 mph	Cincinnati to Columbus	(109 miles)	9.1	(12)
60 mph	Columbus to Cleveland	(139 miles)	10.3	(13.5)
55 mph	Cleveland to Toledo	(110 miles)	7.1	(15.5)

4. Recommended procedure:

    a. Form the class into groups of two.

    b. Pass out the worksheets one to each student.

    c. Pass out one Ohio roadmap to each team of two students.

    d. Tell the class that the data on their handout was collected by a traveling salesman as he drove from one city to another in Ohio. To save on his gasoline bills he wants to figure out at what speed he can run his car while using the smallest amount of gasoline.

    e. Have the students find the mileage log in the Ohio roadmap and demonstrate how it is used.

    f. Have the students look up the mileage between the cities listed on each trip and write their findings in the proper space on the data chart under Miles Traveled).

    g. Observe the different groups and give individual guidance where needed.

    h. Have one student demonstrate at the blackboard how the miles per gallon can be computed by dividing the "Miles Traveled" by the number of gallons used.

i. Have the students record the "miles per gallon" figure for each "trip" on their data table.

j. Ask any group to copy their data table on the blackboard.

5. Discussion questions:

a. Did the salesman drive at the same speed on each of his trips?
b. On which trip did he travel the slowest?
c. On which trip did he travel the fastest?
d. On which trip did he get the most miles per gallon?
e. On which trip did he get the fewest miles per gallon?
f. What conclusions can you draw between driving speed and fuel consumption?

6. References: Ohio roadmaps may be obtained from most gasoline stations or from the Ohio Dept. of Transporation.

Tim Kardatzke
Tim Kreps
Don Bellinger

Geologic Time Worksheet

1. Skill areas to be developed:

   a. The ability to analyze data.

2. Time required: 30 to 45 minutes.

3. Materials needed:

   a. One copy of the geologic time-scale for each student.
   b. One copy of the worksheet for each student.
   c. One physical map of North America on display.

4. Recommended procedure:

   a. Form the class into groups of two.

   b. Hand out a geologic time scale to each student.

   c. Hand out a worksheet to each student.

   d. Ask the students which part of the time scale represents present time.

   e. Ask the students which part of the time scale represents the most distant past.

   f. Have one student go to the physical map of North America and point out the Appalacian, Rocky, Coast Range and Sierra Mountain ranges to the class.

   g. Direct the students to fill in the answers to each question on their worksheet.

   h. Move about the room and give individual guidance where needed.

5. Discussion Questions:

   a. How much of the geologic time scale would be needed to show the time since the American Revolution?

   b. Do oceans and mountains last longer than some forms of life?

6. References:

Interaction of Earth and Time, Interaction Science Curriculum Project, Rand McNally and Company, Chicago, 1972.

THE GEOLOGIC TIME SCALE

Era	Period	Epoch	Years Ago In Time		Oldest Fossils of Various Types	Percent of N. America Under Water	Mountain Building
			Began	Ended			
CENOZOIC	Quaternary	Recent	12,000?			0%	
		Pleistocene	1,000,000	12,000?			
	Tertiary	Pliocene	11,000,000	1,000,000		5%	Coast Range and Sierras*
		Miocene	23,000,000	11,000,000			
		Oligocene	35,000,000	23,000,000			
		Eocene	55,000,000	35,000,000	Horses and camels		
		Paleocene	70,000,000	55,000,000			
MESOZOIC	Cretaceous		135,000,000	70,000,000	Flowering plants	50%	
	Jurassic		180,000,000	135,000,000	Birds, dinosaurs and mammals		Rocky Mountains
	Triassic		220,000,000	180,000,000			
PALEOZOIC	Permian		270,000,000	220,000,000	Pine Trees		
	Pennsylvanian		320,000,000	270,000,000	Reptiles	20%	Appalachian Mountains
	Mississippian		350,000,000	320,000,000	Insects, Amphibians coelacanths	30%	
	Devonian		400,000,000	350,000,000			
	Silurian		440,000,000	400,000,000	Land plants, fish, many animals without backbones		
	Ordovician		500,000,000	440,000,000			
	Cambrian		600,000,000	500,000,000	Many animals without backbones. Sea plants		
PRECAMBRIAN			,000,000,000	600,000,000			

Worksheet

Name ____________________

Date ________ Class ______

THE GEOLOGIC TIME SCALE

Directions: Read each question. Use the geologic time scale handout to come up with the answers. Write your answer in the space provided.

1. Which is the longest type of time unit? an Era, a Period, an Epoch (circle 1)

2. The earliest Era was the ____________________ Era.
It started about ______________ years ago.

3. During which Period did the reptiles show up? ____________________

4. During which Period were dinosaurs on the earth? ____________________

5. Did insects and amphibians develop before or after the reptiles? ______

6. What is the oldest type of life found as fossils? ____________________

7. The Pleistocene Epoch was the time of the glaciers. When were the glaciers starting to move over parts of the earth? ________________

8. Which would be younger; a fossil from the Permian Period or one from the Pennsylvanian Period? ____________________

9. Which Period would a 200,000,000 year old fossil be from? __________

10. Would we find any reptile fossils in the rocks of Silurian age? ______
Why or why not? ____________________

11. Which came first; pine trees or flowering plants? ______________

12. Which mountain range is the oldest? ____________________
Which mountain range is the youngest? ____________________

13. During which Period was North America covered with the most water?
____

14. Could the first insects have inhabited the Rocky Mountains? ________
Why or why not? ____________________

15. The length of time that life has been on earth is what percent of the earth's age? (the earth began at the start of the Precambrian)

______________ per cent

Junior High

William B. Stapp
Talbert Spence

Community Survey

1. Skill areas to be developed:

   a. The ability to define a problem.
   b. The ability to collect data.
   c. The ability to organize data.
   d. The ability to analyze data.
   e. The ability to prepare accurate information on material collected.

2. Time involved: Will vary with the scope of survey.

3. Recommended procedure:

   a. Develop a series of specific questions relevant to your local community that students might seek answers to. You might consider several of the following areas: government, life style, solid waste, water, air, housing, transportation, etc.

   b. Have students group into research teams assigned to do specific subsets of the total survey.

   c. Have research teams obtain data by using the following methods: observation; interviews; reviewing resource materials from public library; using audio-visual equipment (cameras, tape recorders, etc.)

   d. Have research teams evaluate closely all the compiled data and prepare and submit a written report, also to be presented orally by each of the investigative teams.

4. Discussion questions:

   a. What were your initial feelings about your community? (Warm and friendly, cold and impersonal, folksy, etc)? What was responsible for evoking these feelings?

   b. Do you enjoy living in your community? Why or why not?

   c. Does your community have a litter problem?

   d. What is the size (area and population) of your community?

e. Make a diagram to illustrate the basic structure of the political machine of your community government.
   e.g. (mayor, council, city manager, departmental heads, etc.).

f. Does the community have an urban soil erosion and sedimentation ordinance?

5. Reference (Sample type of Questions):

Recreation

1. What are the major recreation facilities (by categories) within the community?

2. What are the major recreation facilities in close proximity to the community which influence the community?

   a. List some of the ways in which this influence is apparent.

   b. How do you go about determining this?

3. In particular, what is the impact of such activities as recreational fishing, camping and winter sports on the community and the surrounding area?

   a. Is the visual access to the park adequate and does the park play a role in improving the aesthetic qualities of the community in which it is located?

   b. Is the physical access for walking and/or driving to the park adequate?

   c. Is the physical design pleasing and are the land contours natural?

   d. Are the park facilities and equipment adequate and creatively designed?

   e. Is the park equipped for year around service?

Cribbage

1. Skill areas to be developed:

   a. The ability to make alternative decisions.

2. Time involved: Approximately 30 minutes

3. Material needed: Deck of playing cards and cribbage board for each set of 2 players.

Cribbage is played with a regular deck of cards (52) and cribbage board (facsimile on page 2). There is a total of 120 points which can be tallied on a sheet of paper when a board is not available.

Scoring

a. Total of 15 = 2 points. Possible combinations.
5 and face card = 2 points. 7-8 = 2 points. Ace, 2, 2, 10 = 2 points. 9 and 6 = 2 points. (many others) 3,2,10.

b. Sequences or runs = (mixed suits)

3 cards needed for a run. 1, 2, 3, = 3 points.
6, 7, 8 = 3 points. 4, 2, 1, 3 = 4 points.
5, 6, 7, 4 = 4 points.
A sequence of 5 will yield 5 points = order disregarded.

c, Pairs = 2

2 of a kind = 2 points. 2 queens = 2 points. 2 4's = 2 pts.
3 of a kind = 6 points. 3 7's = 6 pts. 3 3's = pts.

d. Flush

1. 4 cards in hand = 4 pts.
2. 4 cards in cribbage plus top card (needed) = 5

e. Value of Cribbage

1. When cards are dealt each player discards 1 card for the crib.

2. Dealer counts crib after game; and hands are counted.

3. Crib consists of one card from each player plus top card on deck.

4. Cut at jack = 2 pts.

5. Dealer receives 2 pts. if he cuts a jack.

6. Hold a jack of suit top card on deck = 1 pt.

4. Recommended procedure: Divide class into groups of 2

Playing

1. Each player discards 1 card; player to right of dealer cuts for top card.

2. Beginning with player left of dealer:

Player A = 7
B = 8 B pegged 2 pts.
C = 6 C rc. 3 for a run
D = face card = a total of 31 = 2 pts.
under 31 pts. = A "go" = 1 pt.

Pegging consists of accumulating points by 15's, pairs, or runs as cards are being played.

(see page 3)

3. Dealer deals 5 cards to each.

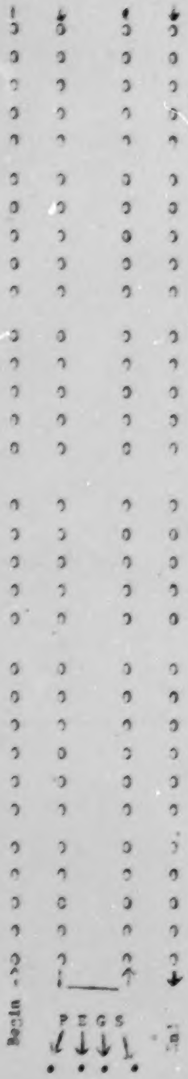
4. Game consists of complete round of cut board.

5. Discussion Questions

a. What possible hands and their value?

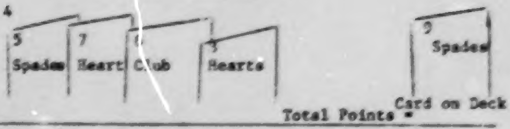
b. Why did I discard to the Crib that card?

c. What cards do I look for and value?


Begin
PEGS
End

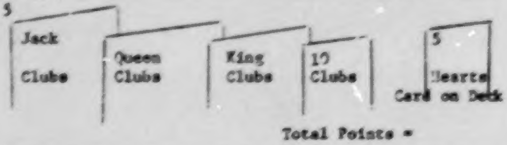
SUGGESTED HANDS

4


5 Spades
7 Heart
6 Club
3 Hearts
9 Spades
Card on Deck

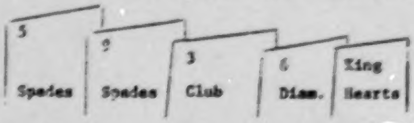
Total Points =

5

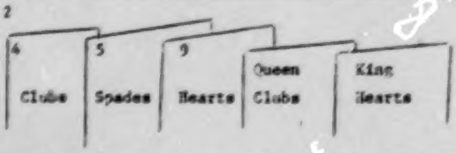

Jack Clubs
Queen Clubs
King Clubs
10 Clubs
5 Hearts
Card on Deck

Total Points =

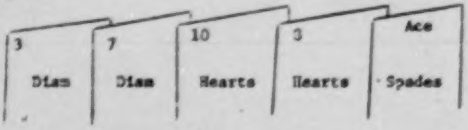
1 Which card would you put in the crib:


5 Spades
9 Spades
3 Club
6 Diam.
King Hearts

2


4 Clubs
5 Spades
9 Hearts
Queen Clubs
King Hearts

3


3 Diam
7 Diam
10 Hearts
3 Hearts
Ace Spades

Junior High   Bill Plummer

Conversion of Units of Measure

1. Skill area to be developed:

   a. The ability to generate alternative solutions.

2. Time involved: 30 - 40 minutes.

3. Material needed.

   a. Five cards with one method on each card. Card explains how to convert units of measure.) Also on each card have several problems to be solved using this method as follows:

      Card #1 Intuitive (most textbooks ignore this process of conversion). Look at the unit of measure. If the unit of measure is getting larger we divide by the number. If the unit of measure is getting smaller we multiply.

      1. Change 30 inches to feet — getting larger units so divide.

      2. Change 15 fathoms to feet — getting smaller units so multiply.

      3. 5 yards to meters — 1 yard = .9 meter, an exception.

      4. 45 feet second to yards/min. Can't be done.

      Card #2 Idiot (found in Kennely's "Tricks of the Trade") Even an idiot understands this method: Look at the numeral. If the numeral gets larger we multiply, if smaller we divide.

      1. Change 30 inches to feet (12) inches = (1) foot gets smaller so divide.

      2. 15 fathoms to feet (1) fathom = 6 feet gets larger so multiply.

      3. 5 yards to meters, (1) yard = (.9) meter exception so multiply.

4. 45 Feet/second to yards/minute can't be done.

Card #3 Renaming (found in Payne's Harbrace, Math 7th and 8th.
Call 12 inches (12x1) and replace the unit to be changed to its equivalent desired new unit 12x1/12 and multiply.

1. 30x1 inch to feet = 30 x (1/12 ft.)
2. 15x1 fathom to ft. = 15 x (6 ft.)
3. 5x1 yd. to meters = 5 x (.9 meters.)
4. $45 \text{x} \frac{1 \text{ ft.}}{1 \text{ sec.}}$ to yds./minutes = $45 \text{ x } \frac{1/3 \text{ yd.}}{\frac{1}{60 \text{ minute.}}}$

Card #4 Proportional (found in Keedy's "Exploring Modern Math I")

1. 30 inches to feet = $\frac{30 \text{ inches}}{x \text{ feet}} = \frac{12 \text{ inches}}{1 \text{ foot}}$
2. 15 fathoms to feet = $\frac{15 \text{ fathom}}{1 \text{ foot}} = \frac{1 \text{ fathom}}{6 \text{ feet}}$
3. 5 yds. to meters = $\frac{5 \text{ yd.}}{x \text{ meters}} = \frac{1 \text{ yd.}}{.9 \text{ meters}}$
4. 45 ft/sec to yds/minute = Can't be done.

Card #5 Cancelling (found in Garrgit's "Exercises of Chemistry.")
Multiply the quantity by a value of one (i.e. $\frac{12 \text{ inches}}{1 \text{ ft.}}$; $\frac{1 \text{ ft.}}{12 \text{ inches}}$ with an arrangement which cancels the given unit and produces the desired unit.

1. 30 inches to feet = $\frac{30}{1} \text{ in}\cancel{\text{ch}}\text{es} \times \frac{1 \text{ ft.}}{12 \text{ in}\cancel{\text{ch}}\text{es.}}$
2. 15 fathoms to feet = $\frac{15 \text{ fa}\cancel{\text{th}}\text{oms}}{1} \times \frac{6 \text{ ft.}}{1 \text{ fa}\cancel{\text{th}}\text{om}}$
3. 5 yds. to meters = $\frac{5 \text{ yds.}}{1} \times \frac{.9 \text{ meters}}{1 \cancel{\text{yd}}.}$
4. 45 ft. per second to yds. per minute =

$$\frac{45 \cancel{\text{ft}}.}{\cancel{\text{sec}}.} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft}}.} \times \frac{60 \cancel{\text{sec}}.}{1 \text{ min.}}$$

4. Recommended procedure:

    a. Divide the class in five groups.

    b. Explain to the class that each group will receive a card with four problems to be solved. Explain further that when they are finished to notify the teacher.

    c. When all groups have finished rotate cards to different groups.

    d. Continue the above procedure until all five groups have done all five cards.

    e. Pick up the cards and proceed with class discussion and questions. List on the blackboard the advantages and disadvantages of each method.

5. Discussion questions:

    a. What are the advantages and disadvantages of each method?

    b. Which method is the easiest?

    c. Which method is the best?

    Possible discussion on advantages and disadvantages of each method.

    1. Intuitive.

        Advantages:

        a. Quick-obvious to about half of the students.

        Disadvantages:

        a. Half don't readily see it.
        b. There are exceptions
        c. Not structural.
        d. Limited to single conversions.

    2. Idiot.

        Advantages:

        a. No thought of units — just the size of the numerals.

        b. Structured.

        Disadvantages:

        a. Limited to single conversions.

        b. There are exceptions.

3. Renaming

   Advantages:

   a. Continues simple algebraic approach of texts.
   b. No exceptions
   c. It is structured.
   d. Multiple conversions possible. (with complex fractions).

   Disadvantages:

   a. Requires Algebraic concept and a simplified inverse relation of intuitive approach.

4. Proportional

   Advantages:

   a. Continues proportional approach of texts.
   b. No exceptions.
   c. It is structured.
   d. No thought of units size.

   Disadvantages:

   a. Requires understanding of proportions.
   b. Limited to Single Conversions.

5. Cancelling

   Advantages:

   a. Structured.
   b. No exceptions.
   c. No thought of unit size.
   d. Can be used in multiple conversion (Also allows faster cancellation of numerals.)

   Disadvantages:

   a. Difficult for average Junior High students.

6. References.

Keedy, M.L., Exploring Modern Mathematics Book I, 1964.

Stein, Edwin J., Refresher Mathematics, Revised Edition, Grades 7, 8; 1970.

Payne, Joseph N., Harbrace Mathematics, Introduction to Secondary Mathematics, 1972.

Junior High

William B. Stapp
Talbert B. Spence

Occupational Prestige Ranking

1. Skill areas to be developed:

   a. The ability to select alternative solutions to a problem.
   b. The ability to solve a problem.
   c. The ability to think critically.

2. Time involved: 45 minutes.

3. Materials needed:

   a. Occupational Prestige Ranking sheets (sample).
   b. Teacher answer key and Letter Code

4. Recommended procedure:

   a. Group students in teams of five or six.

   b. Provide each team member with a ranking sheet; instruct students that this activity is designed to see how close they come to the correct ranking for the occupations listed.

   c. Have each team member read the directions at the top of the ranking sheets; instruct them that their first task is to rank each of the 15 occupations in order of the most prestigious. Allow 10 minutes for completion of this segment.

   d. Instruct each team to discuss among themselves their individual rankings; have each team after about 10 minutes come with a group ranking reflecting how the team as a whole views each occupation's prestige.

   e. Have students in each team share out why he or she agreed to the group ranking or why they didn't agree. (allow 10 minutes)

   f. Teacher provides the correct answer of occupational rankings on blackboard for individuals and teams to do a comparison of their selections to the correct prestige rankings.

   g. Have students total up their individual scores by using the (I-K, see key) to calculate their mistakes on ranking sheet.

   h. Have students total up team scores by using (G-K; see key) to compare how the group did overall in the ranking. (Allow 15 minutes for #f, g, h and Discussion questions).

5. Discussion questions:

   a. How was leadership in the teams formed?

   b. How effectively did the team function?

   c. Was your team able to complete the assigned task? Why?

   d. How were decisions made?

   e. Did any new strategies or ways of doing the ranking activity spring up because your group worked together?

   f. How did you feel as an individual making such a judgement?

   g. Did you feel left out of the team?

   h. How might your team have functioned more effectively?

OCCUPATIONAL PRESTIGE RANKING SHEET

Instructions: rank the following occupations according to the prestige which is attached to them in the United States. Place a "1" in front of the occupation which you feel to be most prestigious, etc., all the way to "15", least prestigious.

I	G	K		I-K	G-K
____	____	____	Author of Novels	____	____
____	____	____	Newspaper columnist	____	____
____	____	____	Policeman	____	____
____	____	____	Banker	____	____
____	____	____	U.S. Supreme Court Justice	____	____
____	____	____	Lawyer	____	____
____	____	____	Undertaker	____	____
____	____	____	State Governor	____	____
____	____	____	Sociologist	____	____
____	____	____	Public School Teacher	____	____
____	____	____	Dentist	____	____
____	____	____	Psychologist	____	____
____	____	____	College Professor	____	____
____	____	____	Physician	____	____
____	____	____	Scientist	____	____
			TOTAL	____	____

Letter Code

A.) I = Individual Ranking
B.) G = Group Ranking
C.) K = Known (Correct) answer
D.) I-K = Individual - minus - Known (Correct Answer)
E.) G-K = Group - minus - Known (Correct Answer)

OCCUPATIONAL PRESTIGE RANKING SHEET

Answer Key

Instructions: rank the following occupations according to the prestige which is attached to them in the United States. Place a "1" in front of the occupation which you feel to be most prestigious, etc., all the way to "15", least prestigious.

I	G	K		I-K	G-K
____	____	(12)	Author of Novels	____	____
____	____	(14)	Newspaper columnist	____	____
____	____	(15)	Policeman	____	____
____	____	(9)	Banker	____	____
____	____	(1)	U.S. Supreme Court Justice	____	____
____	____	(6)	Lawyer	____	____
____	____	(13)	Undertaker	____	____
____	____	(3)	State Governor	____	____
____	____	(10)	Sociologist	____	____
____	____	(11)	Public School Teacher	____	____
____	____	(7)	Dentist	____	____
____	____	(8)	Psychologist	____	____
____	____	(5)	College Professor	____	____
____	____	(2)	Physician	____	____
____	____	(4)	Scientist	____	____
			TOTAL	____	____

Letter Code

A.) I = Individual Ranking
B.) G = Group Ranking
C.) K = Known (Correct) answer
D.) I-K = Individual - minus - Known (Correct Answer)
E.) G-K = Group - minus - Known (Correct Answer)

Junior High William B. Stapp

Six Bits
(Toledo Rapid Transit Bus System)

1. Skill areas to be developed:

   a. The ability to listen with comprehension.
   b. The ability to recognize useful data.
   c. The ability to collect data.
   d. The ability to organize data.
   e. The ability to analyze data.
   f. The ability to draw conclusions.

2. Time involved: 30 minutes.

3. Material needed: Six bit cards.

   a. Card #1

   YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

   Your group has all the information needed to answer the following question:

   > Toledo is considering the establishment of a Rapid Transit Bus System between the suburbs and the city of Toledo. Would the estimated revenue generated by the system be offset by the estimated costs incurred in operating the system?

   Some of the information provided may be irrelevant.

   b. Card #2

   YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

   TARTA needs 5 buses operating on each line.

   A federal grant will provide the initial cost of 25 buses.

   All buses will run for 10 hours per day, Monday through Friday.

   Busses will use the center lane of the expressway for express services.

c. Card #3

YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

There are 100,000 people that live in the suburbs of Toledo that work in the city.

The total cost (operation, maintenance, bus replacement and overhead) of each bus per hour is $35.

TARTA stands for the "Toledo Area Rapid Transit Authority."

d. Card #4

YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

Local bus lines would connect with the rapid transit bus terminals (good connecting services).

There are 20,000 people that live in the city of Toledo and work in the suburbs.

TARTA is planning on operating 5 lines.

e. Card #5

YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

10% of the people that live in the suburbs and work in the city have indicated they would ride buses to work if the services were good.

It takes 35 minutes for an average run on the line

There is parking for 2,500 cars downtown.

Toledo metropolitan area has 1,000,000 people.

f. Card #6

YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

The Rapid Transit Bus system would carry passengers between the downtown area and the suburbs of Toledo.

25% of the people that live in the city and work in the suburbs have indicated they would ride the rapid transit buses to work each day (round trip) if services were efficient.

The Rapid Transit Bus fare would be 25 cents one way and free transfers available for local bus services.

4. Recommended procedure:

   a. Form the class into groups of six.

   b. Pass out the six bit cards to each group (one card to each member of the group.

   c. Give the following directions for the exercise:

      1. One member in each of the groups has a question to be solved by each group.

      2. Participants may not show their card to anyone.

      3. Participants may read the information on the card to anyone in their group.

      4. Some of the information on the cards may be irrelevant.

   d. Give the groups 15-20 minutes to solve or to work toward the solution of the problem.

   e. Ask any group to provide the answer to the question: revenue generated $7500 per day: costs $8750 per day.

5. Discussion questions:

   a. The difference between real and ritualistic listening.
   b. How did leadership unfold during the activity?
   c. How were decisions made?
   d. How effectively did the group function?
   e. How might the group have functioned more effectively?

Junior High

William B. Stapp
Talbert Spence

Common Squares

1. Skill area to be developed:

   a. The ability to determine own resources.
   b. The ability to determine other person's resources.
   c. The ability to define a problem.
   d. The ability to analyze data.
   e. The ability to work with a group.
   f. The ability to help solve a group problem. (how individual can contribute to solution and help others to contribute to solution.)

2. Time involved: 30 — 40 minutes.

3. Recommended procedure:

   a. Five members to a group.

   b. Provide instructions:

      1. Provide each group with five envelopes each with different size pieces to form the pattern of the common squares. (A,B,C,D,E)

      2. Instruct group members that throughout the entire activity there will be no verbal communication between them.

      3. The only communication permitted is when a member gives his team mate a piece that will help him solve his problem.

      4. Inform last group that the task is completed when each member of the group has a square in front of him/her identified in size to that of the other members of his/her group.

      5. After a group has successfully completed the task have them observe (with out talking) the other groups that are still working.

4. Materials needed:

   Five envelopes containing the appropriate pieces of construction paper.

5. Discussion questions:

   a. Who assumed the leadership in the group?

   b. Who was giving help in solving the problem?
      Were you?

   c. Did you accept help from other group members?

   d. Did you have a sense of security during
      the activity?

   e. Did you sense any signs of sexism in your group
      during the activity?

   f. Was there any signs of racism from group members?

   g. Was there group cooperation?

   h. Was there a total group effort to solve the
      groups problem?

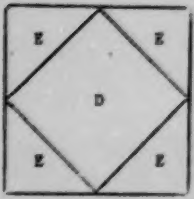
   i. Did your group work as a unit?

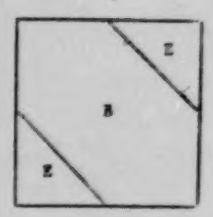
   j. Were you aware of not only your own resources
      (pieces of information — construction paper),
      but resources of others?

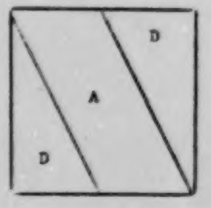
   k. At what point did you feel good?

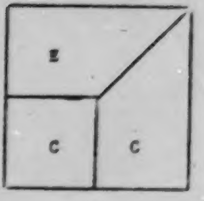
Pattern For Common Squares

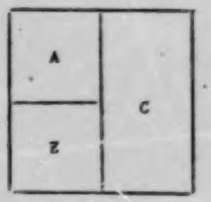
Cut Construction Paper into the Following Pieces
and Place in Envelopes "a–e" according
to the Letters Provided.











Junior High

William Stapp
Talbert Spence

Environmental Assets and Liabilities Survey
(A Micro-urban Investigation)

1. Skill areas to be developed:

   a. The ability to recognize a community environmental problem.
   b. The ability to listen carefully and accurately.
   c. The ability to define a community environmental problem.
   d. The ability to collect data.
   e. The ability to organize data.
   f. The ability to analyze data.
   g. The ability to develop a plan of action.

2. Time involved: 2 (hours).

3. Recommended procedure:

   a. Inventory in your local community the following information:

      1. List the environmental assets of the area (physical and visual).
         (e.g. Historic Landmarks, Natural Features, Structures with Visual Impact, etc.)

      2. List the environmental liabilities of the area (physical and visual).
         (e.g. Conflicting Land Use, Traffic Congestion, Residential Degradation etc.).

      3. Plan a 10 minute report that describes the following:

         a. The information collected;

         b. What general recommendations you might suggest to help improve one of the environmental assets or liabilities in the area.

         c. Social change strategy that you would advocate using to implement one particular environmental asset or liability in the area.

4. Discussion question:

Note: The following questions are designed to help you and students look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed.

a. How do the environmental assets affect the rest of the community?

b. How do the environmental liabilities affect the rest of the community?

c. Which environmental assets have potential for serving as building blocks to improve the livability of this community?

d. What problems exist because of adverse environmental factors in the community?

e. What environmental problems in this community are related to regional environmental problems?

Section III

Values Clarification Activities

135/136

SECTION III

VALUES CLARIFICATION ACTIVITIES

Children and youth of today are confronted by many more choices than in previous generations and will soon be required to make many more environmental decisions affecting their community, nation and world.

The complexity of our times and of environmental decisions has made the act of choosing exceedingly difficult. Ideally, choices are made on the basis of one's underlying values; however, frequently persons (especially young people) are not clear about their own values.

The Values Clarification Process is concerned with trying to help students to become more aware of their own beliefs, attitudes and values; to consider and weigh the pros and cons and consequences of various alternatives; to consider whether their actions match their stated beliefs and if not, how to bring the two into closer harmony; and finally, to try to give students options, in and out of class, for it is only when students begin to make their own choices and evaluate the actual consequences, do they develop their own set of values.

The following are sample Values Clarification strategies that teachers have found helpful in assisting students to clarify their values regarding environmental issues. Though some strategies are recommended as being more appropriate for particular age groups, feel free to change and adapt them for your own uses.

As you become more familiar and comfortable with using the Values Clarification process, you will find that it can easily be included into any kind of teaching unit.

Name Card

1. Time involved: five - ten minutes.

2. Materials needed:

   a. 3 x 5 notecards, one per person.

   b. Pen or pencil.

3. Recommended procedure:

   a. Have participants write their name in center of the card.

   b. Have participants write in the four corners the following information:

      1. Upper left - list 3 things you really value.

      2. Lower left - list 3 figures (alive or dead) that you really admire.

      3. Upper right - list 3 things that you would like to be remembered for after you die.

      4. Lower right - what do you feel are the 3 most serious environmental problems.

   c. Have participants break into groups of 3 and discuss one corner of their cards.

   d. After 2 or 3 minutes, rotate people to other groups, have them then discuss another corner of their cards.

4. Debriefing:

   a. Name Card is a mixer-type activity, used to get participants acquainted.

   b. Helps participants publicly affirm their values.

5. References:

   Simon, Sidney; Leland Howe and Howard Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York: Hart Publishing Co., 1972.

Voting Questions

1. Time involved: 10-30 minutes.

2. Materials needed: none

3. Recommended procedure

   a. The teacher reads aloud each question by asking "Are you someone who....?"

   b. After each question is read the students take a position by a show of hands: *

      1. Those who strongly agree raise the hand high.
      2. Those who agree raise their hand slightly.
      3. Those who disagree lower their hand slightly.
      4. Those who strongly disagree lower the hand fully.

   c. Discussion can follow either each question or after several questions.

   d. This activity can also be written down on a worksheet.

4. Sample valuing questions: Examples for Lower and Middle Elementary grades. Are you someone who:

   a. Would like to live on a farm? *
   b. Likes to go on long car trips? *
   c. Would like to live in a different city someday? *
   d. Thinks you will smoke cigarettes someday? *
   e. Has a private place to go when you want to be alone? *
   f. Would like to plant something and watch it grow?

   Examples for Upper Elementary - Junior High grades. Are you someone who:

   g. Could live happily without electricity?
   h. Could enjoy living in a rural setting?
   i. Would go to school if you didn't have to? *
   j. Would like to change something about this school? *
   k. Would like to live in another country? *
   l. Would ask your parents or someone else you care about to stop smoking? *
   m. Likes to walk or ride a bicycle to a place rather then be driven?
   n. Would like to ride a motorcycle? *

Examples for Secondary Grades. Are you some one who:

- o. Would buy only returnable bottles if both returnable and nonreturnable bottles were present in a store?
- p. Feels modern technology will enable man to continue to to enjoy the present standards of living for many decades to come?
- q. Feels as long as we have to go through democratic processes to make changes, there is no chance of our moving fast enough to save the environment?
- r. Feels that the population problem has a powerful magnifying effect on all our environmental problems?
- s. Would prepare your glass, cans and paper for recycling if it were available?
- t. Thinks that we should have spent all that money to go to the moon?*
- u. Would like to own a snowmobile?
- v. Uses a spray deodorant?

5. Debriefing

   a. Voting questions call for public affirmation of one's values.

   b. Discussion is very important. You can discuss male and female differences.

   c. Example debriefing for spray deodorant issue: The first spray deodorant came out 12 (?) years ago. Now 90% of the population uses spray deodorant. How could we change schools or the race issue as quickly?

   d. Just ask each question and go on unless students want to discuss.

6. References:

Simon, Sidney, Leland Howe and Howard Kirschenbaum. *Values Clarification: A Handbook of Practical Strategies for Teachers and Students*. New York: Hart Publishing Co., 1972.

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* Procedure 3b and Sample valuing questions a,b,c,d,e,i,j,k,l,n and t have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

All Grade Levels

Glen Erickson

Twenty Questions

1. Time Involved: 15 minutes

2. Materials Needed:

   a. pencil and paper

   b. blackboard

3. Recommended Procedures:

   a. Ask the students to write on a piece of paper the number 1-20.

   b. Now have them list twenty things they enjoy to do.

   c. Have students evaluate their list according to the code explained in Debriefing.

4. Sample Valuing Questions:

   a. These can be "big" things in life, or "little" things.*

   b. The students might want to think in terms of the seasons of the year.*

5. Debriefing:

   a. Put the following code on the blackboard for the students to use in evaluating their 20 things.

      $ -- anything that costs over $20 to do
      S -- things you learned in school
      P -- things that pollute or degrade the environment
      N -- things you do in the natural environment
      A -- things you do alone
      Pa-- things you do or did with your parents
      5y-- things you didn't do five years ago
      R -- things that involve risk
      F -- things that you do with your friends

   b. Several code items may be used for each of the twenty things.

   c. The code provides a way to evaluate the types of things you like to do.

d. The code also gives you an idea of the trends you are following in doing enjoyable things.

e. It is a good idea to do this activity at different times in the year to show the students how they might have changed during the year.

f. Declaring the things you enjoy doing provides you with a way of identifying and clarifying what you enjoy.

6. References:

Simon, Sidney: Leland Howe and Howard Kirschenbaum

Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

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Upper Elementary
Junior High
High School

Glen Erickson

Baker's Dozen

1. Time Involved: 10-15 minutes

2. Materials Needed:

    a. pencil and paper

3. Recommended Procedures:

    a. Have each student list 13 electrical appliances they use at home (lights, TV, radio, etc.).

    b. After everyone has completed their list, have each student cross out 3 things he or she can do without.

    c. Next have the students check 3 things they feel they couldn't do without.

    d. Now, have each student circle the items which they obtained within the last 5 years (3 things which would not have been on their list 5 years ago).

    e. Allow the students to share their lists and reasons with the class (you can pick several students or just ask for volunteers).

4. Sample Valuing Questions:

    a. The class could list 13 records they own, identifying the 3 most important and the 3 least important records.

    b. The class could list 13 items they have purchased or been given (bicycle, watch, new clothes, book, etc.) identifying the 3 items they would be most willing to give up, and the 3 items they would least like to give up.

5. Debriefing:

    a. Identifying one's priorities is necessary when considering among various alternatives.

    b. Many electrical appliances are luxury items, which are seldom used, and are not very important to one's life style. Perhaps these items might not be purchased if a person thought about whether the item was very important, or just another thing to buy.

c. The U.S. has doubled its energy consumption in the last 20-25 years. With only 6% of the world's population, the U.S. consumes 37% of all the energy used in the world. A large portion of this increased energy consumption is due directly to the purchasing (it takes energy to produce an electrical applicance, as well as, energy to use it) and use of non-essential or luxury appliances.

d. Identifying those items obtained within the past 5 years indicates personal trends in purchasing and consuming behaviors.

e. Looking at the items crossed out as non-essential, the students can begin to think how easy it is to stop using those items once they have identified them.

6. Reference:

Simon, Sidney, Leland Howe and Howard Kirschenbaum.

Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

Junior High
High School

Glen Erickson

Brand Names

1. Time Involved:

    a. 20-30 minutes class time

    b. 20 minutes homework

2. Materials Needed:

    a. ditto

    b. pencil

3. Recommended Procedures:

    a. Prepare a ditto:

        1. Divide it lengthwise into 2 sections.
        2. Number 1-10 on left margin, and on the top of the left half write: All the Brand Names in Our Bathroom.
        3. Divide the right half into 3 columns:
            (a) Column I, to be used to answer: Who brought the item or article in to the house?
            (b) Column II, to be used to answer: What motivated you or another member of the house to purchase the item?
            (c) Column III, to be used to answer: Was the item selected carefully from among alternatives?

    b. Have the students take the ditto home and record the brand names from the bathroom.

    c. The students should also fill in Columns I and II at home.

    d. After all the students have brought back their completed lists, they can complete Column III by answering its question after referring to the debriefing questions that you place on the board. Column III is for the items purchased or selected by the student.

4. Sample Valuing Questions:

    none

5. Debriefing:

   a. Why did you purchase the various brands?

      1. You heard about it from a friend?
      2. Did you choose the item of your own free will?
      3. Did TV or radio influence your choice?
      4. Do you truly believe in the article?
      5. Was the article on sale?
      6. Do you associate any prestige with the brand (over another).
      7. Did your parents use this brand?

   b. Everyone is influenced in some way be advertising, so students shouldn't feel too bad if most of their Column III responses are negative. What is important is what they do once they realize their choices were not made freely by selecting from alternatives.

   c. A fourth column could be added concerning Column III. The students can answer by using the code letters for each statement:

      K I'll keep it or keep buying it.
      E I'll eliminate it or stop buying it.
      C I'll change to another brand name..
      T I'll have to think more about whether I'll keep it, or eliminate it, or change to another brand name.*

6. Reference:

   Simon, Sidney, Leland Howe and Howard Kirschenbaum.

   Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

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* The code description in 5c has been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

Junior High
High School

Glen Erickson

Coat of Arms

1. Time Involved:

   a. one hour

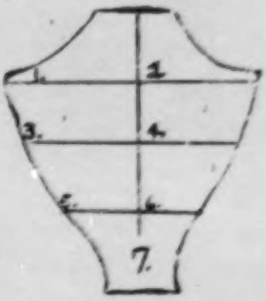
2. Materials Needed:

   a. pencil and paper, or ditto

   b. blackboard

3. Recommended Procedures:

   a. Either make a ditto or have students draw their own coat of arms like the following:



   b. The students are to answer the following questions by drawing a picture or design to illustrate their response for each question in the appropriate space.

      1. One value to which you are deeply committed (value from which you would never budge).
      2. How would your life be different if you won $1 million in a lottery?
      3. Your greatest sacrifice for the environment in the last year.
      4. Your material possession of most value.
      5. Your greatest success symbol.
      6. Something you are striving to obtain (material, personality trait, abstract).
      7. One thing you are thankful for.

c. The students can then share their coat of arms with others (if they wish to), or could be displayed. Art work is not important, as long as the student can recognize his own symbol.

4. Sample Valuing Questions:

a. Draw 3 things you are good at.*

b. What one thing would you want to accomplish by the time you are 65?*

c. What would you do if you had one year to live, and were guaranteed success in whatever you attempted? *

d. What do you admire most in others?

5. Debriefing:

a. This activity is an enjoyable way of helping students think about some important value questions, such as:

1. What am I doing with my life?
2. Am I just reacting to others, or am I in control of the direction of my life?
3. Is my life making any difference?

b. Illustrating values with symbols helps a student to clarify and think about his or her values.

6. Reference:

Simon, Sidney; Leland Howe and Howard Kirschenbaum.

Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

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* The Sample Valuing Questions in #4a,b,c have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

All Grade Levels

Glen Erickson

Rank Order

1. Time Involved: 10-20 minutes
2. Materials Needed:
    a. pencil and paper
    b. blackboard
3. Recommended Procedure:
    a. Explain to class that you will be reading some questions to them, which they will rank order according to their own value perspective. Each question will consist of 3 or 4 alternative choices.
    b. Read a question, and write the alternative responses on the board.
    c. Have the students write down their rank orders (1 for first choice, 2 for second choice, etc.) for that question on a piece of paper.
    d. After everyone has completed their rank ordering for the first question, allow several students to share out their rank orders and their reasons with the class.
    e. Continue this same procedure for all the questions you wish to use.
4. Sample Valuing Questions:
    a.* Which would you least like to be?
        1. Deaf
        2. Blind
        3. Paralyzed from waist down
    b. Would you rather be a
        1. Flower
        2. Tree
        3. Boulder
    c.* Where would you rather be on a Saturday afternoon?
        1. At the beach
        2. In the woods
        3. In a discount store

d.* Which is most important in a friendship?

1. Loyalty
2. Generosity
3. Honesty

e.* Where would you rather live?

1. On a farm
2. In the suburbs
3. In an inner city

f. Which is the least important to you?

1. A horse
2. A dog
3. A deer

g. How many children would you like to have?

1. 0
2. 1
3. 3

h.* What would it be hardest for you to be?

1. A prison guard
2. A welfare inspector
3. An assembly line worker

i. What is the most serious problem facing society today?

1. Education
2. Pollution
3. Racism

j. Rank the following environmental problems in order of their critical nature.

1. Energy
2. Air and water pollution
3. Housing

k.* Which pet would you rather have?

1. A cat
2. A dog
3. A parakeet
4. A turtle

l.* If you were President, which would you give the highest priority?

1. Space program

2. Poverty program
3. Defense program

m. Which method of transportation do you like the most?

1. Riding in a car
2. Riding a bicycle
3. Walking
4. Flying on an airplane

n.* Which do you like best?

1. Ice cream
2. Pudding
3. Jello

o.* Which would you like to do most?

1. Learn to skin dive
2. Learn to ride a horse
3. Learn to ride a mini-bike

p. Which do we need to train more of? Each group to be ranked separately.

Group I	Group II
Lawyers	Skilled Labor
Doctors	Professional
Teachers	Management

q. Which would you rather own?

1. A motorcycle
2. A backpack
3. A TV set

r. You are hiring for a sales position in a chain store. You have three applicants. Which one would you choose?

1. An exconvict
2. Unmarried pregnant female
3. A released mental patient

s. The largest industry (employer) in town is destroying the main river. What action?

1. Arson (violent protest)
2. Boycotting
3. Petitioning city hall

t. What is the most influential factor of social change?

  1. Family
  2. Peer group
  3. Governmental laws

u. You witness a mugging. Which action would you take?

  1. Direct assistance
  2. Call police
  3. Ignore

v. Have the class make up own rank orders.

5. Debriefing:

  a. Publicly affirming one's values helps in clarifying those values.

  b. No order is right or wrong

  c. Sharing out students' reasons for their rank orders helps other students clarify their own values by listening to other alternative rankings, along with the students' reasons.

  d. Helps students understand that many issues require more careful consideration than we normally give them.

  e. Helps demonstrate that to make a decision about an issue requires one to make a choice.

6. Reference:

Simon, Sidney. Leland Howe and Howard Kirschenbaum.

Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

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* The Sample Valuing Questions c,d,e,k,l,o,s and part of a and h have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

Either-or Forced Choice

1. Time involved: 45-50 minutes.

2. Materials needed:

   a. Two blackboards or large pieces of paper.
   b. Can also be done with two slide projectors and appropriate slides.

3. Recommended procedure:

   a. Have students arrange their desks/chairs so that there is a wide path from one side of the room to the other.*
   b. Place blackboards on opposite sides of the room.
   c. Place an either-or question on the blackboards; and ask
   Example: Which do you identify with more
   1. The Four Tops
   2. The Jackson Five
   d. Explain to the students that they are to select one of alternatives and move to that side of the room where it is posted.
   e. Have students form triads to explain briefly why they decided on this choice. Allow 2 minutes per student.
   f. After the 2 minute triads session have students return to the center of the room and ask another either-or question.
   g. Select a student from each opposing views and have them relate to the entire group why they made their particular choice.
   h. This exercise has an unlimited range of alternative questions to ask.

4. Sample of Either-or Forced Choice Questions. "Which do you identify with more:"

   a. Asphalt or grass
   b. Clean air or dirty air
   c. Noisy neighborhood or quiet neighborhood
   d. A clean playground or a littered playground.
   e. Love and understanding or hatred and distrust
   f. New housing or old housing.
   g. Equal rights or no rights
   h. Trees or telephone poles
   i. Expressways or bike routes
   j. Urban community or suburban community
   k. Strip mining or solar energy
   l. Nuclear power plants or steam power plants
   m. Urban farming or high prices
   n. Cooperative living or independent living
   o. Have group suggest other Either-or questions.

5. Debriefing

   a. Note the importance of having individual differences and the freedom to evaluate all possible alternatives to an issue or situation.

b. Participants can physically see how their values relate to the values of the group members.

c. No position or alternative is right or wrong.

d. Sharing out reasons for indivdual choice among group members is important in clarifying individual position.

e. Any two contrasting value statements can be used that apply to the group.

6. **References:**

Simon, Sidney; Leland Howe, and Kirschenbaum. *Values Clarification: A Handbook of Practical Strategies for Teachers and Students.* New York: Hart Publishing Co., 1972.

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Upper Elementary
Junior High
Senior School

Glen Erickson

Values Continuum

1. Time involved: 20 - 30 minutes

2. Materials needed: 5 chairs or desks

3. Recommended procedure:

   a. Arrange 5 chairs or desks in a row, leaving several feet in between each so as to form 4 separate areas along a line.

   b. Explain to the class that you are going to read several value-related statements for which they are to respond by walking to the area which represents their position on the statements.

      1) The spaces should symbolize, left to right, strongly agree, agree, disagree, strongly disagree.
      2) Of course, any student may pass, and not respond.

   c. After each question, have a few students share out their reasons for the particular positions.

   d. Continue this same procedure for other statements.

   e. Let the class or yourself suggest other value statements.

4. Sample valueing questions:

   a. More emphasis should be given to problems of environmental nature which are caused by the individual citizen instead of problems which are caused by industrialists.

   b. The concept of cycles is encountered frequently in ecology. Yet, modern society is ignoring this basic law in its uses of natural resources.

   c. It is primarily the responsibility of the government to control air pollution.

   d. The environmental crisis cannot be solved in the context of our present political and economic system.

   e. Any pollution act of a person is an infringement on the rights of another and should be so regarded in the courts.

   f. Local organization is the key to effective environmental action; that is, battles on big national issues are ultimately based on grassroots supports.

g. As long as we have to go through democratic processes to make changes, there is no chance of our moving fast enough to save the environment.

h. There should be commuter taxes levied on persons who live in the suburbs and work in the central city, and the money used for the construction and improvement of public transit.

i. Modern technology will enable man to continue to enjoy the present standards of living for many decades to come.

j. The younger generation in America really does not want to change the basic way of life in this country.

5. Debriefing:

a. If students tend to cluster together because of peer pressure, you can have the students answer the statements on paper.

b. A wide spread of positions usually indicates a good continuum statement, which causes critical thinking.

c. This activity is good for introducing a particular unit by making statements pertaining to that unit.

6. References

Simon, Sidney, Leland Howe and Howard Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teacher's and Students. New York, Hart Publishing Co., 1972.

Physical Continuum

1. Time involved: 10 - 20 minutes.
2. Materials needed.
    a. Two blackboards or large pieces of paper.
    b. Can also be done with two projectors and appropriate slides.
3. Recommended Procedures:
    a. Place blackboards on opposite sides of room.
    b. Clear area between blackboards.
    c. Write pairs of issues on boards.

       Example City (on one board) - Country (on other board).
    d. Explain to group the choices involved, noting that choices exist from one board to the other board.
    e. Have participants place themselves along the imaginary line between the two boards which have opposite values listed on them.
    f. It is best if you eliminate the possibility of someone standing half-way between boards, so participants must make a choice.
    g. After people have aligned themselves, have them discuss amongst those adjacent to them, their reasons for placing themselves where they did along the physical continuum.
    h. Have people readjust their position, with respect to those people nearest them, to more accurately associate their position on the continuum with their personal value.
    i. Select individuals to relate to the group their reasons for their physical position on the continuum.
    j. Go on to next pair of values and repeat procedure.
4. Sample valuing questions.
    a. City - Country

       Which place would you rather live in?
       Which place would you rather work in?

   b. Powerboat - sailboat

      Which would you rather own? (both items identical in price.)

   c. Snowmobile - cross country skiing.

      Which would rather do?

   d. Have group suggest other contrasting value statements.

5. Debriefing:

   a. Note the importance of people, physcially and publicly affirming their values to better clarify them.

   b. Participants can physcially see how their values relate to the values of other group members.

   c. No position is right or wrong.

   d. Sharing out reasons for individual positions among group members important in clarifying individual positions.

   e. Any two contrasting value statements can be used that apply to the group.

6. References

Simon, Sidney, Leland Howe and Howard Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

Public Interview

1. Time involved: 5-10 minutes per interview.

2. Materials needed: none.

3. Recommended procedure:

   a. Ask for volunteers who would permit a public interview about some of their personal beliefs, feelings and actions.
   b. Explain ground rules several times as to safeguard the students personal feelings.
      (1) The teacher may ask any question about any aspect of his or her life and values.*
      (2) If student decides to answer question, she or he must answer honestly.
      (3) The student has the option to decline to answer question.
      (4) The student can end the interview at any time by simply saying "Thank you for the interview".*
      (5) At the completion of the interview the student may pose any of the same questions to the teacher that were put to him or her.
   c. Each interview should be brief. About 5-10 minutes, unless there is a demand by everyone to continue.
   d. You may want to invite other members of the class to answer any of the questions the interviewee was asked.
   e. After some practice at public interviewing you may want the students to choose the topic they want to be interviewed about.
   f. Instead of conducting the interview, you may want to select a student to conduct the interview. It is important to debrief student on ground rules before allowing any interviewing.

4. Sample interview questions: Lower and Middle Elementary grades.

   a. Do you get an allowance? What kind? Do you work for it?*
   b. If you could be any age, what age would you like to be?*
   c. Will you be a cigarette smoker? Why?*
   d. What about the world around do you wonder about?
   e. Do you think people should be allowed to live anywhere they want to?
   f. What are your feelings about people of other races and cultures?
   g. Do you like living in the neighborhood you are presently living in? Why?
   h. Would you want to live in an area where the air was unclean? Why or why not?
   i. Do you like flowers and trees? Why?

   Examples for Upper Elementary - Junior High grades.

   a. What are your feelings about poverty?
   b. Do you feel comfortable about living in the city?
   c. What are the major problems facing young people today?

d. What is your opinion on public welfare?
e. Is there anything special about family meals at home?
f. How do you feel about man's exploitation of our valuable natural resources?
g. What are some of the reasons for environmental pollution in this country?

Examples for Senior High school.

a. Should your school provide classes dealing with population education?
b. What are your views about racism and sexism in your school? Home? Neighborhood?
c. Do you feel that large energy corporations should be allowed to strip mine for coal on Indian lands? Why? Why not?
d. Do you feel communities should have control of their tax monies which they contribute yearly to the state and federal governments?
e. How important is it to the survival of space ship earth and its passengers to maintain a clean environment?
f. Are there some adults outside of school whom you admire intensely? Why?
g. What are your feelings about a world with universial peace?
h. What has turned you off to school? Why?
i. What are some ways students can contribute to their own education?

5. Debriefing:

a. Discussion is very important. You can compare and contrast male and female responses.
b. Sharing out reasons for individual positions or values is a good way of developing good interpersonal relationships among group members.

6. References:

Simon, Sidney, Leland Howe, and Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York: Hart Publishing Co., 1972.

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* The Recommended Procedure in 3b (1) and (4) and the Sample Interview Questions in 4a,b,c have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

Junior High
Senior High

Glen Erickson

Panel

1. Time involved: 20 - 30 minutes

2. Materials needed:

   a. Eight chairs
   b. Blackboard

3. Recommended procedure:

   a. Place 8 chairs in front of the class, facing the class.

   b. Explain that 8 volunteers are needed to sit on a panel and decide where they stand individually on a series of issue questions and to defend their positions before the class.

   c. After 8 volunteers have seated themselves, ask 4 students one question, and the other 4 another question.

   d. After each panel member (4) has stated his or her position allow the class to question the panel member's position.

   e. Continue the same procedure for both Agree-Disagree questions and for continuum questions.

4. Sample valuing questions:

   a. The following are Agree (hand up) or Disagree (Hand down) questions:

      1) Do you enjoy a rural environment more than an urban environment?
      2) Do you feel you can make an impact on political decisions?
      3) Do you feel comfortable or unthreatened?
      4) Do you think a terminal patient should have the option of euthanasia (mercy killing).
      5) Laws banning non-returnable bottles should be declared unconstitutional?

   b. The following questions are continuum questions answered by having each panel member state where his or her position is on a certain issue question. Place the following on the board:

      Almost always   sometimes — not usually   almost never
      or   or   or
      Strongly agree   agree   neutral   disagree   strongly disagree

      1) Do you wear seat belts (almost always, sometimes, etc.).
      2) Do you feel that additional monies earmarked for highway construction and improvement should be directed to mass transit?

3) Do you believe in legalized abortion?
4) How do you feel industrial abatement devices should be financed?

    a) Government paying a large share (place on left of continuum).
    b) Decrease dividend to stockholders (place in middle of continuum).
    c) Increase price of the product (place on right of continuum).

    (Second part of 4) One of the big 3 auto manufacturers recently announced record sales for 1972 (12% above 1971 and 2% over previous alltime high). This will result in stockholder receiving largest dividend ever - $7.51 per share.

    Does this have any effect on your previous answer?

5) Do you feel that the percentage of state recreation funds to rural areas should be reduced in order to provide more money for urban recreation?

5. Debriefing:

    a. Publicly affirming and defending one's position before peers helps clarify and strengthen one's values.

    b. This activity allows students who don't feel strongly in their own values to listen to other's values and to question them, providing the non-volunteers a way of sorting through their ideas and values.

6. References:

Simon, Sidney, Leland Howe and HowardKirschenbaum Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

All Grade Levels   Talbert B. Spence

The Pie of Life

1. Time involved: 45 - 50 minutes

2. Materials needed:

   a. Blackboard or chart paper

   b. Worksheets (for Upper Elementary, Junior High, Senior High) with drawing of a large circle to be used in diagraming a "pie of life" (see example in 3g).

3. Recommended procedure:

   a. Explain to students that this activity is designed to have them investigate our individual lives - to see how we actually do spend our time, our money, etc.*

   b. Group class into teams of 4-5 students. Explain that these teams are for the purpose of having individual and group decisions on how our time, money, etc. can be used more efficiently.

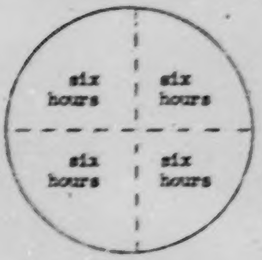
   c. Ground rules: Teacher draws on blackboard/chartpaper or on worksheets a large circle and says, "This circle represents a part of your life".* Explain that the group will be doing several such pies of life.

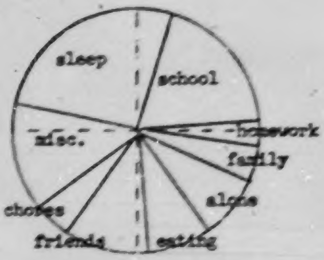
   d. Have students divide their circles into four quarters using dotted lines. Note: For lower elementary and middle elementary this portion of the activity should be done by the teacher at the blackboard.

   e. Explain that each slice represents six hours. Discuss with groups that they are now going to try to estimate how many hours or parts of an hour are spent on the following:

      (1). On sleep?*
      (2). On school?*
      (3). On eating?
      (4). With friends, socializing, playing sports, etc.?*
      (5). Alone, playing, reading, etc.? *
      (6). On homework?*
      (7). Etc. (Any others you can think of)?

f. Have students divide up the time spent in their individual pies of life. Explain that their allotted times will differ from one another. Have them draw slices in their pies to represent proportionately the part of the day they spend on each category. An example might be:





g. After students have completed individual pies (about 10-15 minutes) have the group work toward a group pie of life with the same categories. Have students take about 10 minutes to do this and then have groups share out their results to the rest of the teams.

h. Discuss the importance of using time wisely and efficiently. Emphasize that a large majority of our time spent in a 24 hour period is wasted time; moqt by sleeping (a reasonable amount is needed) and by doing nothing.

i. Have students develop a list of ways to use their time, money, etc. more wisely and efficiently.

j. Examples of other categories that could be used in the Pie of Life strategy:

(1). How does society spend its money?

(2). How much time is spent on cleaning up the environment?

(3). How much money is spent on cleaning up the environment?

(4). How much time is spent by people destroying the environment?

(5). How much time is given to students to plan and make decisions?

(6). How do urban children spend their time daily?

4. Debriefing:

   a. It is important that students start to evaluate how their time and money are spent by them and by others. Also to think about and develop ways of better utilization of their time and money, etc.

   b. Might be a way to discuss alternative life styles, also a way to clarify individual and societal values on time and money.

   c. For lower and middle elementary levels, this strategy could be a way of strengthening knowledge and skills of telling time and understanding what it is all about.

5. References:

   a. Simon, Sidney, Leland Howe and Howard Kirschenbaum. *Values Clarification: A Handbook of Practical Strategies for Teachers and Students*. New York: Hart Publishing Co., 1972.

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Upper Elementary
Junior High
Senior High

Glen Erickson

Agree-Disagree-Undecided

1. Time involved: one class period, 40 - 50 minutes.

2. Materials needed:

   a. ditto
   b. blackboard

3. Recommended procedures:

   a. Prepare a ditto with the following suggested statements dealing with population. Put half the statements on each half of the ditto and cut out each "card" with 1 statement on each.

      1) Population education concepts should be integrated into all the grades and most of the courses taught in primary and secondary school

      2) Human population increases throughout the world are serious. Even with a rate of four births for every two deaths, science and technology cannot provide means for survival (without limiting population growth).

      3) Overpopulation is the basic cause of the environmental crisis.

      4) America's population poses a greater threat to the world ecosystem than India's.

      5) Generally, families should be limited by law to no more than three children.

      6) People should be allowed to have as many children as they want without being told in any way by the government how many they should have.

      7) The government should provide tax and welfare benefits and penalties that would discourage childbearing rather than encourage it, as present systems tend to do.

      8) Due to the controversy connected with "sex" education, it would be self-defeating to link population education with sex education.

   b. Divide the class into groups of 3, 4 or 5 and give each group a set of statement cards.

   c. Have each group decide, as a group, whether their group agrees, disagrees or is undecided for each statement.

d. Have each group sort their cards into stacks for agreeing, disagreeing, or being undecided.

e. After each group has decided on all the statements, tabulate on the board the number of groups agreeing, disagreeing, or being undecided on each statement. Allow about 20 minutes.

f. Discussion of the reasons for different groups' positions can then take place.

4. Sample value questions:

a. Statements concerning a particular issue like housing, pollution costs, or environmental responsibility or ethic.

b. Any statements concerning a particular lesson activity the class is doing.

5. Debriefing:

a. This activity is good to introduce a specific unit, as in the case, population. It helps the class become more sensitive to the unit before doing any encounter or activity.

b. Group decision-making is different from individual decision-making, because a consensus must be reached in a group, with people compromising their positions. All the group members benefit by listening to other member's feelings, and attitudes, which helps the individual re-evaluate his or her own position.

Upper Elementary
Junior High
Senior High

Talbert B. Spence

Ways to Live

1. Time involved: 2 sessions of 45 minutes each

2. Materials needed:

   a. Blackboard or worksheets

   b. Chart paper and markers

   c. Pencils

3. Recommended procedure:

   a. Explain to students that this activity will deal with the formulation of their own philosophy of life by responding to a variety of ways to live.

   b. Generate a list of 10 - 13 different life style by asking students to describe a kind of life style they now live, have read about, heard about, seen, or possibly dreamed about. Be sure extreme views are represented.

   c. Expand this list of life styles into philosophy statements by asking questions such as the following:

      (1). In this life style, does the individual person have a say in how his town is run?

      (2). Is money important in this life style? How important?

      (3). Is education important?

      (4). Do people care about other people?

   d. List these life style description statements on the blackboard, on chart paper (or on a ditto for a second session). A sample statement might be (complexity depends on the age group):

      Way 1: The individual actively participates in the political and social life of the community, to be a primary change agent in altering the present political system of his country. In this life, excessive monetary desires are avoided and moderation or a natural living is sought. Life is marked by physical and mental discipline, love, and friendship. Life is to have clarity, balance, intelligibility and respect for cultural differences.*

e. Have students respond to the 10 - 13 Ways to live statements by ranking each statement from first desire to least desire using the following key:

7 - I like it very much.
6 - I like it quite a lot.
5 - I like it slightly.
4 - I am indifferent to it.
3 - I dislike it slightly.
2 - I dislike it quite a lot.
1 - I dislike it very much.*

Be sure students understand that their ranking does not depend on what kind of life they lead now, or the kind of life they think is unnatural to live in our society, but simply the kind of life that they personally would like to live.

f. After students have completed their ranking, about 10-15 minutes, have students team up with another student and discuss their individual rankings. Allow about 5 minutes for this discussion.

g. Ask volunteers to give their individual rankings and record their responses on the chart paper.

h. Group students into teams of 5-6 individuals. Instruct them that within a 15 minute period they must come up with a group decision on the ranking of the 10 - 13 ways to live. Have each group record their rankings on chart paper.

i. Have students write out their own way of life statement. This should reflect their philosophy of life at this point in their lives.

j. Finally, have students think and list ten things they have done in the last week that that are consistent with their philosophy of life (e) or the way they live described in (i).*

5. Debriefing:

a. Do you think there is any one life style that is right for all people?

b. Are you satisfied with your life style?

c. Did the group find it difficult or easy to agree on ranking?

d. Did the group decide your way? or did you give in to the group?

e. What did you learn about yourself?

f. Add any other observations or questions about the dynamics going on during the group decision-making session.

g. Discussion on alternative life styles is important because the student is exposed to other cultural and noncultural ways of living.

6. References:

a. Simon, Sidney: Leland Howe and Howard Kirschenbaum. Values Clarification: A Handbook of Pratical Strategies for Teachers and Students. New York: Hart Publishing Co., 1972.

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* The Recommended Procedures 4d (a condensation of Way 1), e and j have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

Junior High
(Water Quality)

Oak Park Schools

Priorities Choice

1. Time Involved: One class period

2. Materials Needed: Paper and pencil
   Chalkboard or ditto paper

3. Recommended Procedure:

   a. Present this situation to the group:
   A small lake-front community is dependent on a single industry. The run-off wastes from this industry are discovered to be the cause of the loss of natural fresh drinking water supply to many surrounding communities. What do you think should be done?

      (1). Close the plant resulting in massive unemployment?
      (2). Allow the plant to remain open.
      (3). Make the plant install costly anti-pollution devices and remain closed until completed.
      (4). Allow the plant to remain open while anti-pollution measures are installed (within a time schedule).
      (5). Appoint a committee to study the entire situation.

4. Valuing Activities:

   a. Use a continuum to visually project the varied positions of the students.

   b. Teacher plays "Devil's Advocate" with statements such as:

      (1). The industry will price itself out of business if required to put in too costly a device.

      (2). Lakes have been used to dispose of wastes for years and years.

5. Debriefing:

   a. How would you feel if the town affected by unemployment was yours?

   b. How would you feel if the town was a neighboring one only affected by the water pollution?

   c. How would you feel if the town was distant from your town and their situation did not directly affect you?

6. References:

   a. Sidney B. Simon, Leland W. Howe, Howard Kirschenbaum, Values Clarification: A Handbook of Practical Strategies for Teachers and Students, Hart Publishing Co., Inc., 1972.

Section IV

Junior High School Environmental Encounters

SECTION IV

Environmental Encounters

This section contains a series of sample school-community environmental problem solving activities (Environmental Encounters). In these environmental encounters students (with guidance from the teachers) actively become involved in exploring and critically evaluating their environment and existing environmental problems. The students may then begin to develop alternatives and plans of action for solving environmental problems. As students become actively involved in environmental problem solving they gain the opportunity to acquire both knowledge and skills necessary to deal with current and future environmental problems.

Included are sample environmental encounters relating to all grade levels and disciplines starting with early elementary encounters, which concentrate mainly on developing a basic awareness and appreciation for the environment, and ending with senior high encounters, in which students may actually become involved in the political process in trying to implement the designed plans of environmental action.

You may find it helpful to adapt some of the sample encounters for use in your particular classes. However, you will probably find that the "best" environmental encounters are ones jointly developed with your students around their environmental interest and concerns.

Environmental encounters are included for each of the four grade levels. Within each level there are sample encounters for the following topics:

1. Ecology and Pesticides
2. Water Quality
3. Air Pollution

4. Recreation

5. Policy and Planning (soils, land use, planning, and environmental law)

6. School Site Development

7. Transportation

The encounters represent a wide diversity, so that some are applicable to inner city, and some to suburban and rural situations.

Junior High
Air Pollution

Junior High Science

William [illegible]

INVESTIGATING AIR POLLUTION

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Identify an air pollution problem within the local area.

2. Identify the importance of fire or factory causing pollution to the area.

3. Define the major types of air pollution.

4. List (number) effects of air pollution on living organisms.

5. List some of the laws which have been recently passed in an effort to control air pollution.

6. Identify the law enforcement agencies that enforce these laws.

ACTIVITIES: Investigating a local factory:

1. Find a plant, factory or shop in the area that is emitting some type of air pollution.

2. What is the function of the plant? What is their product? What are the processes used to produce that product?

3. Classify the type of air pollution. Is it a result of particle emissions, gas emissions, or both?

4. To get an idea of how much pollution is given off in a way of particular matter perform this simple experiment: Get (number) large plates. Cover one side of the plates with a greasy or sticky substance such as vaseline. Set one of these plates near the point of pollution with another plate a little further away and so on. Come back after a period of time (depending on the amount of pollution) and observe the particulates that have settled on the plates.

5. What effect do you think these particulates would have on living organisms? Go to the library and try to find some more information on this subject.

6. Considering the production process used by the plant, what types of chemical gases might also be given off as a source of air pollution? What effect do you think these gases have on the surrounding environment?

7. Set up (number) terrariums in the back of the room. Place an open beaker which has been filled with the same chemical that is used in the factory in the terrarium. Place a couple of light bulbs against the sides of the terrarium. This will provide a source of light for the

7. (continued)
plants and will also raise the temperature in the terrarium which will speed up evaporation of the chemical. Make sure the top of the terrarium is covered (you may want to vaporize the chemical in a flask and pipe the chemical vapor into the terrarium). If you suspect tow or more chemicals are given off by the factory you can test the others in the same way or you may want to combine a couple of the vapors to find out if this has a different effect on the plants.

8. What effect, if any, did the vapors seem to have on the plants?

9. Do you think some type of pollution control should be placed on that factory or shop? Which of the political structures would handle this? How could you bring it to their attention?

10. Develop a plan of action and execute it.

Junior High
Air Pollution — Junior High Social Studies — Paul Koenig

INVESTIGATING A LOCAL SOURCE OF POLLUTION

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter a student should be able to:

1. Identify what type of fuel is used to furnish power for the generators of a local power plant.
2. Identify what type of pollution is present.
3. List three things adversely affected by the air discharge from the power plant.
4. Determine an alternative fuel that could be used.
5. Compare the cost of the regular and alternate fuel.
6. Describe in writing the benefits that would result from the use of an alternate fuel.
7. List the standards for clean air in this area.
8. Identify the type of equipment used by the plant to diminish air pollution.
9. Develop a plan of action to reduce the amount of pollution created by this power plant.

ACTIVITIES:

1. Visit a local electric generating plant using fossil fuel. What type of fuel is being used for a power source? Why is this fuel used in preference to other types?
2. Inspect the discharge from smoke stacks or obtain information from the proper authority.
3. Determine the degree of "fall-out" by distributing vaseline-smeared plates in the vicinity of the plant.
4. Based on observation determine the effect of pollutants on (a) vegetation, (b) paint and homes, (c) lung disease rates, (d) visibility.
5. Investigate to find out the cost per unit of other available fuels. Will the use of other fuels result in less contamination?
6. Correspond with authorities to determine what standards have been established for clean air. Are regulations being ignored and why?

7. Interview the company engineer to find what type of abatement device is used for smoke control. Is this type adequate for the emissions and work load?

8. Research various air pollution abatement devices and their effectiveness. Present two more effective alternatives for abatement (if needed) to the power plant and the regulatory agency.

9. Develop a plan of action to help the power plant aquire a more adequate abatement device if one proves needed. Carry out the plan.

Junior High
Ecology

Junior High Science

William [illegible]

INVESTIGATING A GRASSHOPPER POPULATION

BEHAVIORAL OBJECTIVE:

At the completion of a successful encounter, the student should be able to:

1. Make an accurate estimate of an animal population in relation to its immediate environment.
2. Identify two ways that math is important to solve scientific problems.
3. Describe four basic controlling factors of populations and how the degree of their interaction determines the population of a species for a particular area.
4. Name seven natural factors that have a bearing on the four basic population controls.
5. Draw the grasshopper in a food chain which is related to the study area.
6. Identify a major problem that could be caused by an over population of grasshoppers.
7. Describe in writing how a reduced population may upset the local ecological balances.
8. Describe ways in which man controls insect numbers - both old and new.
9. Describe why the estimate of the grasshopper population was probably not accurate, but if the same methods were used on a larger animal with fewer numbers (e.g. rabbits or deer) the estimate would be fairly accurate, thus becoming a valuable conservation tool.

ACTIVITIES:

A trip to a parcel of land.

1. What do you think the grasshopper population of a specific field is? Do you think it would be higher in a woodlot?
2. As you look at the area what do you feel would be the grasshoppers' prime source of food?
3. To estimate the population we will use the mark, release and recapture method. The first day you will go into the field with a net, paint brush, and paint. Catch as many grasshoppers as possible, mark them with a small dab of paint, then release them. Keep an accurate count.
   The second day capture as many grasshoppers as possible and in a separate column mark down the number of recaptures from the previous day.

Now using the formula $\frac{\text{No. Marked}}{\text{Total Pop.}} = \frac{\text{No. Recaptured}}{\text{Total 2nd Capture}}$

an estimate can be made.

4. As you look over the results, why do you think we only recaptured a small portion of the grasshoppers marked the previous day? How do you think their loss was balanced out?

5. What do you think would be some natural conditions that would affect emigration, immigration, natality and mortality?

6. As you walk around, what types of animals do you see in the area? Why are they important to the area? What types of food do they eat? Draw a food chain linking the grasshopper to these animals.

7. What effect would an over population of grasshoppers have on an area? (Show the movie 'Rival Worlds', Shell Oil Company).

8. How do you keep down the number of insects around the house? What about farmers? How can we control insects without the use of harmful chemicals?

9. Read "The Whitetail Story" by the Department of Natural Resources and evaluate, in a class discussion, the importance of population studies in determining the number of doe permits for certain areas.

Junior High
Ecology Pesticides

Leonard Thuemmel

Junior High Business on Social Studies

INVESTIGATING THE USE OF PESTICIDES BY INDIVIDUALS AND LOCAL GOVERNMENT

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Define what a pesticide is.

2. Identify the major pesticides presently being used in the community.

3. List (No.) potential dangers and actual damages which will result from their use.

4. Describe in writing the existing local state, and national, laws governing the use of pesticides.

5. Identify one usage of chlorinated hydrocarbons in the community and state an alternative to control the target pest.

6. Identify (number) persistent pesticides being used in the community.

7. Identify the types and amount of pesticides used by local government.

8. Identify the types and amount of pesticides used by local people.

9. Identify the major usage of pesticides in the local community: individuals or government.

10. Develop a plan of action to resolve one of the local pesticide problems.

ACTIVITIES:

1. Carry out a short inventory of what a pesticide is.
    a. What is covered by the term pesticide?
    b. What is a pest?

2. Have a county agricultural extension agent come in & speak on pesticides.
    a. Identify different kinds of pesticides.
    b. What are the major kinds of pesticides used today?
    c. What are some of the more harmful pesticides and their effects?

3. Obtain information regarding the present, local state and national laws that govern the use of pesticides in the state. (County agent, Department of Agriculture, Michigan State Extension.)

4. Identify the major chemicals that are persistent and have serious lethal side effects.

5. Determine the types of chemicals and alternative programs that are more ecologically sound in pest control.

6. Contact a local official and determine the kinds and amounts of pesticides being used by the local government.

7. Have the class survey the major stores in the area that handle pesticides to determine the pesticides they handle and the approximate sales.

8. Compare the two figures to find out who is the big user. (Local people or local government.)

9. Have the class go around and talk to their neighbors to determine:
   a. The kinds of pesticides they use.
   b. The amount of pesticides they use.

10. Interview a tree service in the area (see yellow pages) as to their methods of pest control.

11. Chart the different types of pesticides that are used in the area to give an indication of local usage.

12. Establish a plan of action to reduce the usage of persistent pesticides and to educate some population segment about more ecologically sound pest control measures.

13. Implement the plan.

Junior High
Policy and Planning
Junior High Art
Evelyn Ayres

LANDSCAPING THE GROUNDS AROUND A SUBURBAN HOME

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, a student should be able to:

1. Identify (number) major concepts of landscape design that apply to the landscaping of a home.
2. Describe how the major concepts of behavioral objective #1 could be utilized to redesign the landscape of a yard around a suburban home.
3. Identify from observation (number) special problems regarding the landscaping of a particular parcel of land.
4. Identify (number) values of beauty, spaciousness, and privacy around the house to the resident.

ACTIVITIES:

1. Field Trip —
   After arrangements have been made with the homeowner, visit the homesite in groups of ten. Choose a chairman for each group.
2. Make three preliminary sketches
   a. Make a quick sketch of trees, shrubs, and plants as they exist.
   b. Make an illustration sketch of a view of the house with the landscaping as you would desire it to be.
   c. Make an empty space layout to fill in back in class.
3. Contact homeowner to find out what part of his grounds he wishes left unchanged. Relay this information to the class.
4. Hold an open discussion (presided over by a student chairman) as to the best plan of action. Some issues to be discussed might be:
   a. What trees and shrubs to transplant and where.
   b. Where flower beds go, and what flowers for easy care.
   c. What plants might replace spring flowers and bulbs after blooming.
   d. Discuss different flowering seasons.
   e. Facts concerning soil and fertilizer.
   f. How to care for annuals and perennials.
   g. How to transplant small evergreens, etc.
5. To obtain information, visit a local nursery after school to obtain answers to questions raised in class. As groups are visiting the homesite, students in class could be doing research and the correlation of art work.

6. Draw from life ten sketches of plants, flowers, or living things such as birds, insects or animals. Students may use reference books.

7. Finish three plates from the above ten sketches in pastels, watercolor, and ink. Craft classes could work in the media of clay, or printmaking.

8. List and identify flowers, plants, trees, birds, insects, and grasses you have observed in this encounter. (Ten each).

9. On a chart, show how many types of life depend upon each other for food. Tell what might happen if one segment of the food cycle were eliminated.

10. Work out a timetable of the work needed to be done each day. Divide in groups, of volunteer to work for a day.

11. Describe in a few instructions how to care for the landscaping which was completed, and a chart of what was transplanted.

12. Evaluate in a group discussion, then visit the homeowner on the success of the project. Discuss:

    a. Did I learn of any area problems of which I was not aware?
    b. Was awareness of nature, ecology, and man's environment increased?

13. When project is completed, show the work of the encounter on a special bulletin board at school.

14. Give the story to the newspaper.

Junior High
Policy & Planning   Junior High Science or Social Studies   William Vengante

INVESTIGATING THE DEVELOPMENT OF A SHOPPING CENTER

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to

1. Identify (number) environmental problems associated with particular shopping center.
2. Identify the types of people that use the shopping centers.
3. Describe in writing the value of a well planned and designed shopping center.
4. List (number) ways in which a shopping center can be constructed so as to appeal to all age groups and provide a pleasant place for relaxation.
5. Design a more beautiful and feasible plan for a shopping center than presently exists.
6. Identify the people upon which the cost of such designing would fall.
7. Construct a plan which would prevent shopping centers of low environmental design from being built in the community.

ACTIVITIES: A trip to a local shopping center, or a bus tour to several.

1. What types of people use this shopping center? Does anyone use it for anything other than shopping?
2. Take a series of slides comparing various shopping centers in the area.
3. What observations can be made about scenery, micro-climate, traffic patterns? What do you prefer?
4. Compare this shopping center to one of the larger ones in Detroit area such as Eastland or Northland. What differences are there?
5. As you look around you, can you think of any multiple use for this area (social center, art fair, speakers, dancing, exhibitions, etc.). What types of people might enjoy the uses you suggest?
6. What would you suggest be added to this shopping center to make it more attractive, enjoyable and thus bring more people to the area to do their shopping?
7. Lay out a new design for the shopping center which will take into account environmental design concepts.
8. Make two models of the shopping center; one as it looks now and the other exhibiting the new environmental design that you propose.

9. If your plan for remodeling the shopping center were to be adopted, who would have to assume the cost? Do you think store owners would be willing to spend this money? How would two different stores such as, for example, Farmer Jack and American Bakery share the costs?

10. How could this problem have been solved in the first place? What can be done to upgrade future shopping centers in the area?

11. Develop a plan of action and present it to the proper political department in your community.

Junior High
Recreation

Junior High Business

Leonard Townsend

INVESTIGATING THE POSSIBILITY OF DEVELOPING A SMALL NEIGHBORHOOD PARK

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Identify the major recreational interests of junior high youth in the neighborhood of the school.
2. Identify what parks and facilities are available in the neighborhood.
3. Identify what parks and facilities are needed in the neighborhood.
4. List 6 areas in the neighborhood that could be used for a park to meet the needs identified in behavioral objective number 1.
5. Identify the owners of the land.
6. List (number) of the major natural and artificial features of each area.
7. Describe in writing the distribution of ages in the neighborhood population.
8. Describe the physical and visual access to each potential park area.
9. List (number) different ways of purchasing the land from its owner.
10. List (number) different ways of obtaining funds for purchasing the land.
11. Identify (number) different ways of financing the development of the land.
12. Identify the people that would be responsible for the maintenance of the park after it is built.
13. Develop a plan of action to get a park developed.

ACTIVITIES:

1. Take a poll of junior high students to find out what they want in the way of recreation.

2. Take a survey of the area to find out what parks are presently available for recreation.

3. What parks and facilities are needed in the neighborhood?
    a. Is the population mostly retired, high school age, elementary or pre-school age?
    b. What are the main interests of the people in this area?

4. Plan a field trip to the subdivision for the purpose of finding available land to be used for a park.

5. Obtain a map of lots in the subdivision to see who owns the land and to find out if there are any restrictions on this property.

6. Obtain a topographic map of the area.
    a. What is the terrain of each area?
    b. Will drainage be a problem?

7. Have the students work in groups to map out the 4 areas.
    a. How many houses in each area?
    b. Are the roads good in each area?
    c. Will the roads take the added use?

8. Have the class draw a model of each of the 4 areas, (including the roads and terrain of the area).

9. Have one of the local real estate men come in to explain the ways of obtaining the land.

10. Have the students list different ways of paying for the land.

11. Have the students list different ways of paying for the building of the park.

12. Find out (or arrange for) who will maintain the park.

13. Arrange for the class to make a presentation before individuals and organizations that make and influence recreational policy.

Junior High
Recreation

Junior High Business

Leonard Townsend

DEVELOPING A TEEN CENTER IN THE COMMUNITY

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Identify the need for a teen center in the community.
2. Identify a building that could be renovated into a teen center.
3. Identify who this teen center would serve.
4. List (number) activities which could be carried out in a teen center.
5. Design physical features within the teen center.
6. List equipment needed in the teen center.
7. List (number) sources of local promotional support for a teen center.
8. Identify (number) ways of financing a planned center.
9. Develop a plan of action to get the teen center started.

ACTIVITIES:

1. Take a survey of the students in the school.
    - a. Would you support a teen center?
    - b. What social activities should it have? (Dances, live band, snack time.)
    - c. What physical activities should it have? (Pool table, ping pong, tennis, others).
    - d. Would you pay to attend this center? (Yearly membership, by event, other).
    - e. How and who should control this center?
    - f. What should the days and hours be that the center would be open?
2. Have a real estate person in to talk to the class about available buildings in the area and the possibility of using one of them.

3. Have a group discussion in class to draw up guidelines on what teens will be able to use the center.

   a. Students just from this school?
   b. Whoever buys a membership card?

4. Work in groups to draw up rules for the center covering the following:

   a. Drinking and/or smoking
   b. Age limit
   c. Should we have a teen governing board?
   d. If adults should help, what adults should help control the teen center? (Police, teacher, parent, member town council.)

5. Write to other towns that have a teen center and find out the types of activities they have and how they have the different parts of the building set up.

6. Draw up plans that could be used, listing what types of equipment would be needed.

7. Write letters and visit meetings for possible sources of local support in the area. (Parents, police, churches, school, town council.)

8. Find out what the cost of running a teen center would be and ways this money could be obtained.

9. Identify an individual or policy groups that would help regulate a teen center.

10. Work as a class and ask the student council for help to put this plan into action.

11. Present this plan to civic groups to help put the plan into action.

Junior High
School Site

Junior High Science

William [illegible]

INVESTIGATING THE DEVELOPMENT OF A POND FOR THE SCHOOL SITE

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Draw and read topographical maps.
2. Construct a map depicting the various land structures.
3. Identify different soil types, the characteristics of each and the importance of this information in the development of an area.
4. Test percolation of an area and understand its importance in the development of an area especially for housing.
5. Identify the natural ecological characteristics of the land.
6. Identify the importance of these natural features for learning.
7. Identify the importance of specialized outside resource personnel in the development of such an area.
8. Write out a plan for the use of the area identifying rationale for one's decisions.
9. Choose the proper action which will best promote the importance of such an area and its value as an educational tool.

ACTIVITIES: Development of a Pond.

1. Make a topographical map of the area showing the contour of the land.
2. Make another map of the area designating the location of wood-lots, swamps and grasslands. On this map make special notations of any natural points of interest that should be saved if at all possible.
3. Using a ground bore dig down in various places throughout the proposed area. Keep accurate notations of the different soil layers and their depths.
4. Take samples of each layer and determine their types by running them through sieve screens.
5. Test the percolation of the soil in various places.

6. Take a series of photographic slides of the area and its features.

7. Using this information, decide with the students the best location for the pond.

8. With the help of the U.S. Soil Conservation Service lay down a blueprint for the pond designating the shape, depth, etc.

9. Plan some safety features that should be included such as docks, life savers, etc.

10. Check the cost of insurance for such an area and the exact coverage.

11. Make a scale model of what the completed area would look like including the pond, future tree plantings, nature trails, etc.

12. Obtain three estimates from different companies to determine the cost of the project.

13. Make a presentation of the proposed development to the student body and allow them to voice any suggestions and objections.

14. Submit the entire report to the principal, superintendent and school board members for approval.

INVESTIGATING A SCHOOL SITE FOR LANDSCAPE DEVELOPMENT

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. List the physical features of the site to be developed.
2. Describe in writing a plan for landscaping the school site.
3. Draw a sketch incorporating the best features of plans that have been submitted.
4. List two problems that would hamper completion of the project.
5. Identify the individuals or groups who are responsible for the approval of the site development.
6. Develop a plan of action to facilitate the solution of one of the problems states in question #4.

ACTIVITIES:

1. Conduct a survey to determine soil condition and drainage. What natural features can be utilized to the best advantage?
2. Gather information from the Dept. of Agriculture bulletins and local soil conservation district to assist in layout and selection of plantings. Obtain price qutitations from three nurseries.
3. Investigate three methods by which funds may be raised to finance the project.
4. Each class member will submit a drawing of the proposed landscaping. Selection of the four best drawings will be made by a designated committee.
5. Discuss two problems that might hinder the successful completion of the project.
    a. How would you counteract acts of vandalism?
    b. What conditions of soil or climate would be a barrier to success?
    c. Are there regulations which must be observed?
6. By inquiry find out who makes the final decisions concerning land site improvements. Do many people enter into this decision or is it a matter for the school board alone?

7. Investigate what has been done concerning similar projects in other communities.

8. Present plans and recommendations to those who will make the decision.

Junior High
Transportation

Junior High Social Studies

Paul Koenig

INVESTIGATING A PROPOSED HIGHWAY PROGRAM

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter a student should be able to:

1. Describe in writing two reasons for the construction of intrastate highway (_______).
2. Draw a plan showing the projected route of intrastate highway (_______).
3. Draw a plan showing an alternate to intrastate highway (_______).
4. List three major problems which would affect the community as the result of the construction of intrastate highway (_______).
5. Describe in writing two advantages that would accrue to the community as a result of the alternative you have identified in question #3.
6. Develop a plan of action to help establish the alternative identified in question #3 if you feel it is in the public interest.

ACTIVITIES:

1. Make a survey to determine the concentrations of auto and truck traffic on present roads that would be relieved by intrastate highway (_______).
2. From examination of the surrounding terrain decide what natural features of the landscape would be altered or destroyed by intrastate highway (_______).
3. What plans are suggested to preserve tree growth and prevent stream alteration? Will ponds resulting from excavation be a safety hazard?
4. Describe three problems which should be considered in relation to condemnation procedures and securing required easement for construction of the highway. What plans are suggested for proper drainage?
5. List three economic benefits which will result from the building of the intrastate highway.
6. Select a committee to identify one alternative to intrastate highway (______).
7. Draw a map showing the alternative to intrastate highway (_______).
8. Develop a plan of action to help establish the alternative identified in Behavioral Objective #3 if you feel it is in the public interest.
9. Work toward the implementation of your plan.

Leonard Thuemmel

Junior High School Social Studies Class

INVESTIGATING THE SEWAGE TREATMENT PROBLEM

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. List 3 major problems associated with the local sewage treatment plant.

2. List 3 major problems associated with septic tank units.

3. Compare the operation of a sewage treatment plant to that of a septic tank unit.

4. List the regulations of a sewage treatment plant for a municipality, town, county, and state.

5. Diagram the local sewage treatment plant and briefly describe how it treats sewage at each stage.

6. Describe a more efficient sewage treatment plant that could be used.

7. List alternative solution to one of the sewage treatment problems noted in behavioral objective one and two.

8. Identify civic authorities who are responsible for proper sewage treatment in the area.

9. Identify (number) different ways of financing an improved sewage treatment plant.

10. Develop a plan of action to help solve one of the problems identified in behavioral objective number one.

ACTIVITIES:

1. Plan a field trip to the local sewage treatment plant to find out how sewage is broken down and put back into the environment.

    a. What are some of the problems of this plant?

    b. How does this plant work?

    c. How complete is the treatment?

    d. Where does the effluent go?

2. Show slides of outside problems and explain how some of the homeowners treat their sewage. Explain the operation of a sewage field.

3. Examine the regulations at the municipality, township, county, and state levels.
    a. List the regulations that pertain to the sewage treatment system that relates to the home of each student.
    b. List the advantage and disadvantages of the different regulations to the students.
4. Use local resource people to talk on the functions of different sewage treatments that can be used — primary, secondary, tertiary, other.
    a. What is a sewage field?
    b. How is sewage put back into the environment?
5. Work in groups to draw up a few different ways of treating sewage. (What improvements would this make to our environment?)
6. Interview those parties in the area who are responsible for sewage treatment problems. Find out if they are working for improvements.
7. List different ways of paying for improvements that may be needed and figure out the cost to the people for these improvements.
8. Develop a plan of action to resolve one of the problems of the sewage treatment plant.
    a. Write letters to the local civic people that are involved in treating sewage.
    b. Write to the local paper pushing for action to let the people know what is needed.
9. Execute the plan of action.

Junior High
Water Quality — Junior High Science — William Veegaete

INVESTIGATING MERCURY POLLUTION

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter the student should be able to:

1. Identify (number) major water pollution problems.
2. Describe in writing (number) ways that pollution from one community can affect another community.
3. Develop a plan for testing the effects of mercury on an organism.
4. Identify (number) mercury poisoning symptoms.
5. List (number) economic results of mercury pollution.
6. Identify the power structure which governs the controls that are set up to regulate and cut down on the amounts of pollution that are taking place throughout the state.

ACTIVITIES: Investigating mercury poisoning in a laboratory

1. What has recently happened in the Detroit area which has made everyone conscious of the need for strict water pollution controls.
2. Find out where this mercury came from. If the mercury was dumped into the water at Port Huron how did the fish in the Detroit area, which is located some sixty miles to the south, become contaminated? Why was the southern part of Lake Huron also banned from fishing?
3. What effect does mercury have on a living organism? Go to the library for more information on this subject or write to some outside resources for more information.
4. Set up two large aquariums each containing the same size and species of fish. Obtain some mercury treated seeds from a local store. Feed the fish in one of the aquariums fresh hamburger but embed some of the mercury treated seeds in it. Repeat this daily for an extended period of time. (Do not continue the experiment beyond the point that you notice symptoms of physical disorders).
5. What do you suspect will happen to the fish that are fed the mercury treated seeds? How are birds affected, such as pheasants, that eat these seeds right after they are planted by farmers?
6. Find out some of the economic consequences that have resulted from this problem in your state.
7. Develop a plan of action to resolve one of the problems indicated by your findings.

8. Submit your plan to the entire student body and allow them to make any suggestions or objections. Alter the plan if necessary. Have the students vote on the plan.

9. Present the proposal to the chosen target agency: the Dept. of Natural Resources, an industry, City Commission, or other appropriate target.